1859 FIFTY-EIGHTH YEAR 1916

AMERICAN GAS LIGHT JOURNAL

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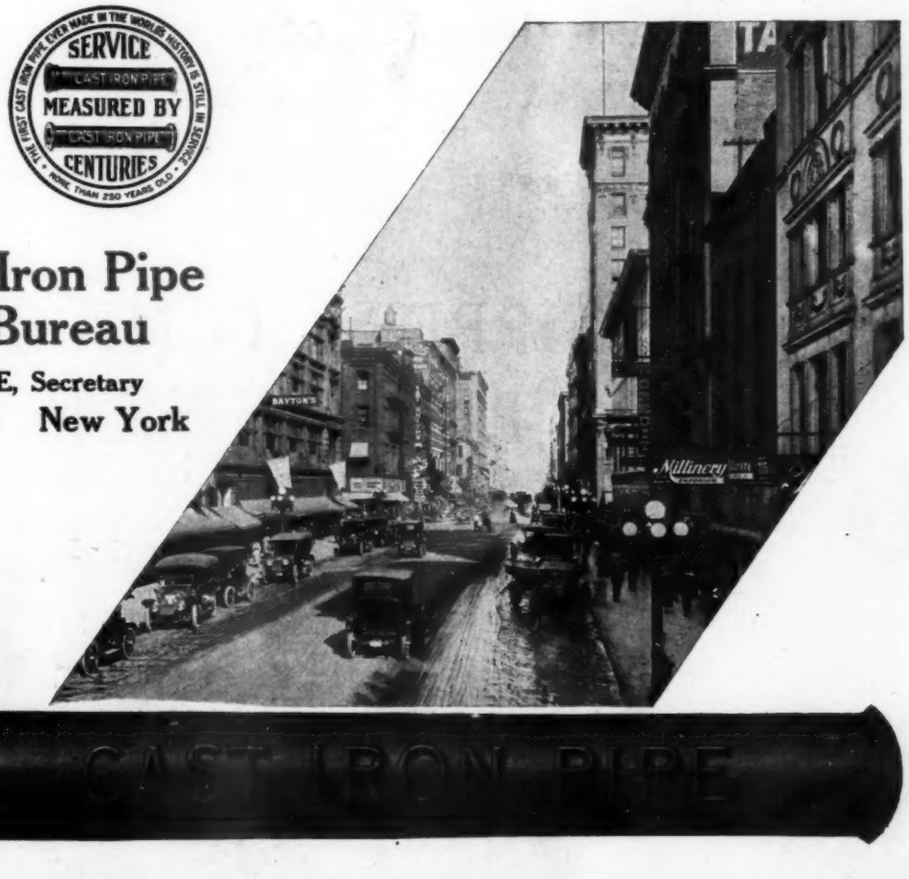
No wonder there are 1,150 miles of Cast Iron Pipe in Minneapolis!

Some time ago the Water Department of Minneapolis had occasion to examine Cast Iron Pipe that had been in the ground for 32 years. This examination proved the pipe to be in precisely the same condition as when first laid.

No wonder Minneapolis is enthusiastic about Cast Iron Pipe!

But the enthusiasm of this city is no keener than that of hundreds of others in which Cast Iron Pipe has given long years of faithful service.



The Cast Iron Pipe Publicity Bureau

R. C. McWANE, Secretary

1 Broadway - New York

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KOPPERS

BY-PRODUCT COKE AND GAS OVENS

The most efficient method of carbonizing coal is in KOPPERS OVENS and the best coke and by-products are produced by this process.

H. KOPPERS COMPANY

Pittsburgh, Pa.

Builders of

By-Product Coke and Gas Plants
Tar Distilling Plants
Ammonia Recovery Plants
Benzol Recovery Plants

1859 FIFTY-EIGHTH YEAR 1916

AMERICAN GAS LIGHT JOURNAL

VOL. CV., No. 18. NEW YORK, OCTOBER 30, 1916 WHOLE No. 3,060.

Baltimore's Method of Testing Hot Air Delivered by Hot-Air Gas Fired Furnaces Has Given Highly Consistent and Satisfactory Results

General Practice for Ascertaining Amount of Air Drawn Into and Delivered by Hot Air Furnace has been to Resort to Use of Anemometers, Pitot Tubes and Approximate Calculations—Best of These Lead to Only Fairly Accurate Results

By H. M. RILEY

Assistant Superintendent, Distribution Department, Consolidated Gas, Electric Light & Power Company of Baltimore

Each succeeding year in the gas industry sees those companies which are large enough, and, at the same time sufficiently broad, to maintain appliance testing laboratories, exercising and developing a spirit of great resourcefulness along the line of supplying the customer with gas consuming devices which, both qualitatively and quantitatively, measure up to the work for which they are intended. For, after all, assuming that the laboratory is adequately equipped with the necessary brains and paraphernalia for testing, it is the attribute of resourcefulness on the part of the men directing the work that truly measures its worth to the company and public alike.

Likening laboratory practice to the much hackneyed adage of cracking a hard nut, the man must apply the nut cracker of intelligence with levers of practice and theory to the appliance under test, and with the well directed force of proper methods, expose the kernel of real worth of the device.

Different Appliances Require Different Methods of Attack in Testing

It goes without saying that different appliances require different methods of attack in the testing of them, but let it be remembered that many require much originality, the devising of entirely new schemes and the performance of not a few "mental gymnastics" in order to fathom out their exact characteristics.

The general practice for ascertaining the amount of air drawn into and delivered by a hot air furnace has been to resort to the use of anemometers, pitot tubes, approximate calculations and the like, but at best these methods lead to only fairly accurate results. True, in its proper place, the pitot tube is a very useful and accurate instrument, but the results obtained from it in testing the amount of hot air delivered by a hot-air gas fired furnace are not consistent.

With this idea in mind, the Baltimore Company's laboratory worked out a method for testing which may or may not be "as old as the hills." At all events, however, the results obtained therefrom are both highly consistent and satisfactory.

Method in Use at Baltimore

Briefly stated, it consists in lighting up the furnace, and, after thermal conditions become constant, a gas of known composition (such as the gas served to the city) is allowed to flow at a known rate into the base of the heat pipe just where it leaves the furnace proper. Then, by analyzing a sample of hot air (actually a mixture of air and known gas) taken at a point in the heat pipe just above the place where the known gas was introduced, and comparing the results with the analysis of the known gas, the amount of dilution of the air, and lastly the quantity of air itself can be calculated. It might be mentioned that the sampling tube should have its end closed, should contain perforations along its entire length and must run well across the entire diameter of the hot air outlet pipe. Naturally, if the furnace has several outlet pipes for the hot air, samples must be taken from each one at the same time.

Below follow the data and calculations of an actual test on a gas fired Hot Air Furnace:

Observed Data

Time of Test	2 Hours
Cu. Ft. of Gas used (corrected)	318.4
Temperature of Gas	76 deg. Fahr.
Barometer	30.15 in.
Gas Pressure	2.6 in. water
B. T. U. Value of Gas	595 per cu. ft.
Humidity	56 per cent
$C O^2$ in Air in Test Room	Negligible
Average Flue Temperature	338.1 deg. Fahr.
Average Temperature Inlet Air	152.2 deg. Fahr.
Average Temperature of Room	79.8 deg. Fahr.
Temperature Heat Pipe No. 1	305.2 deg. Fahr.
Temperature Heat Pipe No. 2	280.6 deg. Fahr.
Temperature Heat Pipe No. 3	287.6 deg. Fahr.
Temperature Heat Pipe No. 4	294.3 deg. Fahr.

Gas Analyses

	Fuel Gas to Burner	Flue Gas	Mixture Heat Pipe No. 1	Mixture Heat Pipe No. 2	Mixture Heat Pipe No. 3	Mixture Heat Pipe No. 4
$C O^2$	3.0	10.8	0.15	0.15	0.15	0.15
C^2H^4	6.5		0.30	0.35	0.30	0.35
O^2	0.5	5.0	20.00	19.70	19.80	19.80
C O	20.2		1.00	1.10	1.00	1.10
C H^4	21.7		1.01*	1.05*	1.00*	1.05*
H^2	43.4					
N^2	4.7	84.2				

*Estimated on basis of first four constituents in the respective analyses. Known gas (fuel gas) passed into heat pipe at rate of 2.0 cu. ft. per minute.

Calculations

Air Required for Combustion

Combustion Table

Constituent	Per Cent	Cubic Feet	O^2 Needed	Air Needed	$C O^2$ Given Off	$H^2 O$ Given Off	N^2 Resulting
$C O^2$	3.0	9.5			9.5		
C^2H^4	6.5	20.7	62.1	296.2	41.4	41.4	234.1
O^2	0.5	1.6	–1.6	–7.6			–6.0
C O	20.2	64.3	32.2	153.7	64.3		121.5
C H^4	21.7	69.1	138.2	659.2	69.1	138.2	521.0
H^2	43.4	138.2	69.1	330.3		138.2	261.2
N^2	4.7	15.0					15.0
	100.0	318.4	300.0	1431.8	184.3	317.8	1146.8

Hence, $\left(\frac{1431.8}{318.4}\right)$ = 4.52 cu. ft. of air are required per cu. ft. of fuel gas to completely burn it.

EXCESS AIR

This is gotten by equating the amounts of carbon in the fuel gas and the flue gas.

Carbon in fuel gas:

CO^2	$9.5 \times 1.98 \times \frac{12}{44}$ =	5.130 oz.
C^2H^4	$20.7 \times 1.26 \times \frac{24}{28}$ =	22.356 oz.
CO	$64.3 \times 1.26 \times \frac{12}{28}$ =	34.722 oz.
CH^4	$69.1 \times 0.72 \times \frac{12}{16}$ =	37.314 oz.
Total Carbon		99.522 oz.

Carbon in flue gas:

Assume "a" to be the total cu. ft. of flue gas,

$$CO^2 - a \times 1.98 \times \frac{12}{44} \times .108 = .05832a \text{ oz.}$$

Equating and solving we find a = 1706.5 cubic feet of dry flue gas.

Now due to combustion the following dry flue gases obtain:

	Nitrogen	1146.8 cu. ft.
	Carbon dioxide	184.3 cu. ft.
	Total	1331.1 cu. ft.
Difference	1706.5	
	1331.1	
	375.4 cu. ft. = excess air.	

$\frac{375.4}{318.4}$ = 1.18 cu. ft. of excess air per cu. ft. of gas burned.

Water vapor due to humidity carried in by air for combustion and excess air.

Maximum tension for mercury @ 79.8 deg. Fahr. = 1.03 in.

$$\left(\frac{30.15-1.03}{30.15}\right) y = (1.18 + 4.52)\ 318.4$$

y = 1879.2 cu. ft. of air and water vapor
1814.9 cu. ft. of air

64.3 cu. ft. of water vapor accompanying the air for combustion and excess air at 100 per cent saturation.

Since humidity was 56 per cent,

64.3 x .56 = 36.0 cu. ft. of water vapor actually accompanying air for combustion and excess air.

COMPOSITION OF GASES LEAVING FLUE

184.3 cu. ft., CO^2
78.1 cu. ft., O^2
60 deg. Fahr. 1444.1 cu. ft., N^2
30.00 Barometer 317.8 cu. ft., H^2O vapor due to combustion
36.0 cu. ft., H^2O vapor due to humidity

DRY AIR DELIVERED BY HEAT PIPES

Carbon in known gas (240 cu. ft. passed in 2 hours)

CO^2	$7.2 \times 1.98 \times \frac{12}{44}$ =	3.8880
C^2H^4	$15.6 \times 1.26 \times \frac{24}{28}$ =	16.8480
CO	$48.48 \times 1.26 \times \frac{12}{28}$ =	26.1780
CH^4	$52.08 \times 0.72 \times \frac{12}{16}$ =	28.1220
Total		75.0360 oz. passing through each heat pipe.

Carbon in Mixture of known Gas and Air drawn in:

Let

a = air + known gas in Heat Pipe #1
b = " " " " " " " #2
c = " " " " " " " #3
d = " " " " " " " #4

(a)

$CO - a \times .0015 \times 1.98 \times \frac{12}{44}$ =	0.000810a
$CH - a \times .0030 \times 1.26 \times \frac{24}{28}$ =	0.003240a
$CO - a \times .01 \times 1.26 \times \frac{12}{28}$ =	0.005400a
$CH - a \times .0101 \times 0.72 \times \frac{12}{16}$ =	0.005454a
Total	0.014904a oz.

(b)

$CO^2 - b \times .0015 \times 1.98 \times \frac{12}{44}$ =	0.000810b
$C^2H^4 - b \times .0035 \times 1.26 \times \frac{24}{28}$ =	0.003780b
$CO - b \times .011 \times 1.26 \times \frac{12}{28}$ =	0.005940b
$CH^4 - b \times .0105 \times .72 \times \frac{12}{16}$ =	0.005670b
Total	0.016200b oz.

(c)

$CO^2 - c \times .0015 \times 1.98 \times \frac{12}{44}$ =	0.000810c
$C^2H^4 - c \times .0030 \times 1.26 \times \frac{24}{28}$ =	0.003240c
$CO - c \times .01 \times 1.26 \times \frac{12}{28}$ =	0.005400c
$CH^4 - c \times .01 \times 0.72 \times \frac{12}{16}$ =	0.005400c
Total	0.014850c oz.

(d)

$CO^2 - d \times .0015 \times 1.98 \times \frac{12}{44}$ =	0.000810d
$C^2H^4 - d \times .0035 \times 1.26 \times \frac{24}{28}$ =	0.003780d
$CO - d \times .011 \times 1.26 \times \frac{12}{28}$ =	0.005940d
$CH^4 - d \times .0105 \times 0.72 \times \frac{12}{16}$ =	0.005670d
Total	0.016200d oz.

Dry air delivered by Heat Pipe #1:
.014904a = 75.036
a = 5035 cu. ft. in 2 hours.

Dry air delivered by Heat Pipe #2:
.0162b = 75.036
b = 4632 cu. ft. in 2 hours.

Dry air delivered by Heat Pipe #3:
.01485c = 75.036
c = 5053 cu. ft. in 2 hours.

Dry air delivered by Heat Pipe #4:
.0162d = 75.036
d = 4632 cu. ft. in 2 hours.

Water Vapor due to Humidity carried in by air which finally exits through the 4 Heat Pipes.

Maximum tension for Mercury @ 79.8 deg. Fahr. = 1.03 in.

$$\left(\frac{30.15 - 1.03}{30.15}\right)y = 19352$$

y = 20036 cu. ft. air and water vapor
19352 " " air

684 cu. ft. of water vapor accompanying air passing through heat pipes @ 100 per cent saturation.

Since Humidity was 56 per cent:

684 x .56 = 383 cu. ft. actually accompanying air through heat pipes.

Water Vapor due to Humidity passing out of Heat Pipe #1:

$$\frac{5035}{19352} \times 383 = 99.6 \text{ cu. ft.}$$

Water Vapor due to Humidity passing out of Heat Pipe #2:

$$\frac{4632}{19352} \times 383 = 91.7 \text{ cu. ft.}$$

Water Vapor due to Humidity passing out of Heat Pipe #3:

$$\frac{5053}{19352} \times 383 = 100.0 \text{ cu. ft.}$$

Water Vapor due to Humidity passing out of Heat Pipe #4:

$$\frac{4632}{19352} \times 383 = 91.7 \text{ cu. ft.}$$

Heat Balance

Calculated @ 30.00 Barometer and above 60 deg. Fahr.

Sensible Heat in Fuel Gas:

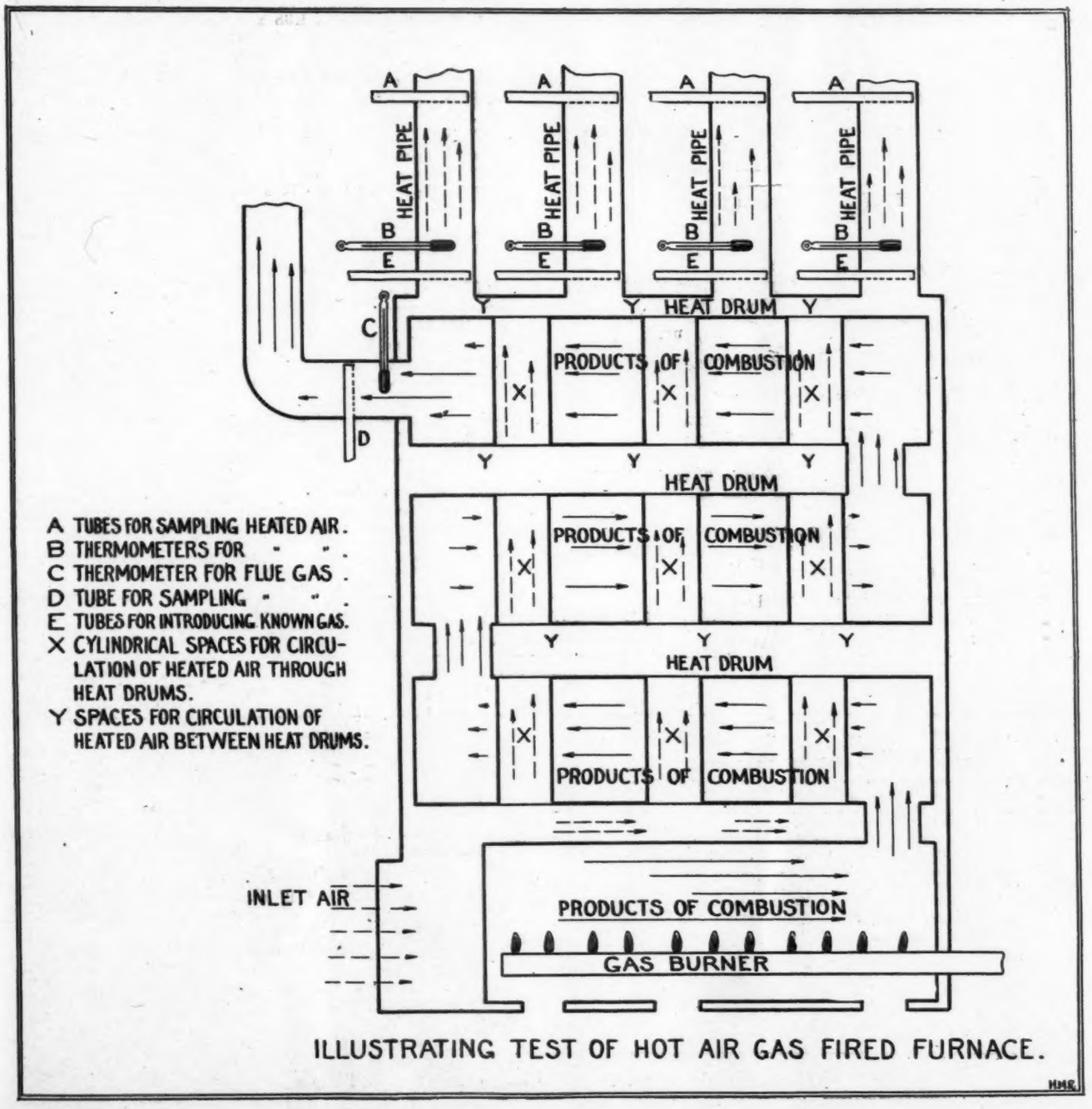
$C\,O^2$— 9.5 [.023 +.000008 (76—60)] (76—60)= 3.52 B.t.u.
C^2H^4—20.7 [.0287+.000008 (76—60)] (76—60)= 9.56 B.t.u.
$C\,H^4$—69.1 [.0237+.000008 (76—60)] (76—60)=26.34 B.t.u.
H^2)
O^2)—219.1 [.0189+.0000009 (76—60)] (76—60)=66.31 B.t.u.
$C\,O$)
N^2) 105.73 B.t.u.

Thermal Value of Fuel Gas:

595 x 318.4 = 189448.0 B.t.u.

Sensible Heat in Dry Air for Combustion:

1814.9 [.0189+.0000009 (79.8—60)] (79.8—60)=679.8 B.t.u.



ILLUSTRATING TEST OF HOT AIR GAS FIRED FURNACE.

HMR.

Sensible Heat in Water Vapor accompanying air for combustion:
36 [.021+.000005 (79.8—60)] (79.8—60)=15.04 B.t.u.
Total Heat supplied:

	105.7
	189448.0
	679.8
	15.0
Total	190,248.5 B.t.u.

Sensible Heat in Flue Gas:
C O^2— 184.3 [.023+.000008 (338.1—60)] (338.1—60)=1291.59 B.t.u.
O^2) —1522.2 [.0189+.0000009 (338.1—60)]
N^2) (338.1—60)=8106.63 B.t.u.
Sensible Heat in Wtr. Vapor (due to Humidity) of excess air. } 36 [.021+.000005 (338.1—60)] (338.1—60)=211.24 B.t.u.
Sensible Heat in Water Vapor due to combustion:
317.8 [.021+.000005 (338.1—212)] (338.1—212)=866.80 B.t.u.
Latent Heat in Water Vapor due to combustion:
317.8 cu. ft. x .0379 lbs. x 970.4 = 11,687.50 B.t.u.
Sensible heat in Liquid Water due to combustion:
12.04 lb. x (212—60) = 1830.08 B.t.u.
Total Heat in Flue Gas:

	1291.59 B.t.u.
	8106.63 B.t.u.
	211.24 B.t.u.
	866.80 B.t.u.
	11687.50 B.t.u.
	1830.08 B.t.u.
	23993.84 B.t.u.

Heat Passing out of Heat Pipe No. 1.
Sensible Heat in Air:
5035 [0.0189+0.0000009 (305.2—60)] (305.2—60)=23604.08 B.t.u.
Sensible Heat in Water Vapor due to Humidity:
99.6 [0.021+0.000005 (305.2—60)] (305.2—60)=542.62 B.t.u.
Heat Passing Out of Heat Pipe No. 2.
Sensible Heat in Air:
4632 [0.0189+0.0000009 (28.6—60)] (280.6—60)=19514.62 B.t.u.
Sensible Heat in Water Vapor due to Humidity:
91.7 [0.021+0.000005 (280.6—60)] (280.6—60)=446.58 B.t.u.
Heat Passing Out of Heat Pipe No. 3.
Sensible Heat in Air:
5053 [0.0189+0.0000009 (287.6—60)] (287.6—60)=21965.39 B.t.u.
Sensible Heat in Water Vapor due to Humidity:
100.0 [0.021+0.000005 (287.6—60)] (287.6—60)=502.01 B.t.u.
Heat Passing Out of Heat Pipe No. 4.
Sensible Heat in Air:
4632 [0.0189+0.0000009 (294.3—60)] (294.3—60)=20728.20 B.t.u.
Sensible Heat in Water Vapor due to Humidity:
91.7 [0.021+0.000005 (294.3—60)] (294.3—60)=476.85 B.t.u.
Total Heat Passing Out of Heat Pipes:

	23604.08 B.t.u.
	19514.62 B.t.u.
	21965.39 B.t.u.
	20728.20 B.t.u.
	542.62 B.t.u.
	446.58 B.t.u.
	502.01 B.t.u.
	476.85 B.t.u.
Total	87780.35 B.t.u.

Initial Sensible Heat in Air and Water Vapor to be heated supplied to the Furnace.
Sensible Heat in Dry Air:
19352 [0.0189+0.0000009 (79.8—60)] (79.8—60)=7249.26 B.t.u.
Sensible Heat in Water Vapor:
383 [0.021+0.000005 (79.8—60)] (79.8—60)= 166.83 B.t.u.
Total 7416.09 B.t.u.
Net Heat Imparted to Air (plus its water vapor):
87780.35 B.t.u., Total Heat Passing out of Heat Pipes
7416.09 B.t.u., Initial Heat (before air and water vapor enters Furnace)
80364.26 B.t.u. Net Heat

EFFICIENCY OF FURNACE

$$\frac{80364.3 \times 100}{190248.5} = 42.2 \text{ per cent}$$

Heat Lost via Flue Pipe:

$$\frac{23993.8 \times 100}{190248.5} = 12.6 \text{ per cent}$$

Radiation and Unaccounted for Losses:

$$\frac{85890.4 \times 100}{190248.5} = 45.2 \text{ per cent.}$$

NOTE.—Mr. R. S. McBride, U. S. Bureau of Standards, offers the excellent suggestion of substituting Carbon Dioxide gas for the known gas, thereby eliminating the possibility of forming an explosive mixture and at the same time simplifying the calculations.

In the accompanying illustration "Thermometer B" and "Tube E" should be interchanged as regards location.

TABULATED HEAT BALANCE SHEET

(Calculated @ 30.30 Barometer and above 60° Fahr. Temp.)

	Medium (Air) Heated		Heat Supplied	Heat Disbursed		
	Initial Heat Content	Final Heat Content		Flue	Usefully Used	Radiation and Other Losses
Thermal Value of Gas			189448.0			
Sensible Heat in Air needed for Combustion			539.1			
Sensible Heat in Water Vapor needed for Combustion			11.9			
Sensible Heat in Excess Air			140.7			
Sensible Heat in Water Vapor in Excess Air			3.1			
Sensible Heat in Fuel Gas			105.7			
Sensible Heat in Air to be Heated	7249.2					
Sensible Heat in Moisture in Air to be Heated	166.8					
Sensible Heat in Heated Air		85812.3				
Sensible Heat in Moisture in Heated Air		1968.0				
Sensible Heat in Flue Gases				10476.2		
Latent Heat in Water Vapor due to Combustion				11687.5		
Sensible Heat in Liquid Water due to Combustion				1830.1		
	7416.0	87780.3				
		7416.0				
		80364.3				
					80364.3	
Radiation and Other Losses (By Difference)						85890.4
Totals			190248.5	23993.8	80364.3	85890.4
				190248.5		

Gas Holder Tanks at Sheridan Plant Built for Internal Pressure of 100 Lb.

Coal Which Will Be Used Mined 15 Miles From Plant—Necessary to Protect Mains Against Alkali—Capacity of Plant Will Be 200,000 Cu. Ft. Per Day

The 7 x 36-ft. steel tanks which will be used as gas holders at the Sheridan, Wyo., Gas Works now under construction, are built for an internal pressure of 100 lb., although a storage pressure not in excess of 30 lb. is contemplated for the present.

The plant is being built for a daily capacity of 200,000 cu. ft. and will be strictly a coal gas plant of the high pressure type. A service governor will also be installed ahead of each service meter, which will bring the main pressure down a further step to 3½ oz. delivery pressure.

JOINTS WELDED BY OXY-ACETYLENE

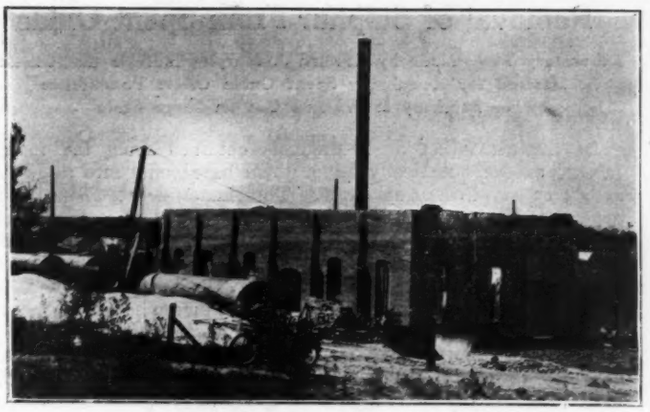
Five miles of the largest mains have already been laid, and there are ten miles yet to be installed. The work on the distribution systems will be continued throughout the Fall until cold weather necessitates a shut-down.

The company's franchise runs for 50 years, from November, 1915, and the rate specified therein is $1.20 per thousand cubic feet, less 10 cents per thousand for bills paid on or before the tenth of each month.

Sheridan County coal, which is mined within fifteen miles of the plant, will be used, and it has already been determined that there will be a local market for the greater portion, if not all, of the tar produced.

The retort benches at the works are being built by the Improved Equipment Company of 60 Wall Street, New York City, and the condensing apparatus by the Steere Engineering Company of Detroit, Mich. A 70 x 18 x 20 in. Marsh Compressor, built at Battle Creek, Mich., and a No. 4 direct-connected steel-driven Roots Exhauster, built at Connersville, Ind., will be used. The

SPECIAL FOR BRIDGE CROSSING MADE ON WORK



SHERIDAN PLANT UNDER CONSTRUCTION

storage and relief tanks are being built by the Sheridan Iron Works of Sheridan, Wyo. The station meter is a Hinman drum, purchased from D. McDonald & Company of Albany, N. Y., and the meter order has been placed with the Metric Metal Works of the American Meter Company of Erie, Pa., for cast-iron B Meters. The stove contract for the year has been placed with Rathbone, Sard & Company, of Albany, N. Y.

For the distribution system National Tubing steel pipe is being used, National coated, to guard against alkali and oxidization, which is necessary in that country, and all joints, fittings, Y's and specials are being welded by the oxy-acetylene process.

LINE TESTING PUMP AT WORK

Twelve hundred service connections are to be put in, and, for this purpose 1 x 3-in. nipples, threaded at one end—the non-threaded end being welded to the pipe into a hole burned in by using the torch and connected to the service by two elbows—are being used. This, it is considered, gives a compound joint and provides for any movement in the pipe through expansion or contraction.

The works building is of steel, brick and concrete, and of fireproof construction. The main building is 71 ft. 3 in. x 40 ft. 6 in., and 20 ft. high at the side walls, with coal storage bunkers and purification tanks attached, the latter part of the building being 18 ft. x 88 ft., and an average height of 11 ft.

The works were designed and are being constructed by the Pierce-Bacon Engineering Company, Central Savings Bank Building, Denver, Colo.

Boston Company Issues Attractive Circular On Gas-Fired Steam Boilers

Under the title. "Steam Without Coal," the Boston Consolidated Gas Company has issued an attractive circular which points out the advantages of gas-fired steam boilers, which describes and illustrates their various uses and gives testimonials from those who have made use of them. An ingenious artifice resorted to was the leaving out of all mention of the advertiser's name until the very end of the booklet.

Removal of Sulphur From Spent Oxide

Laboratory Tests Made by Edward J. Murphy Indicate that Method Devised for Reclaiming Spent Oxide Offers Possibilities of Economy If Worked Out on Large Scale

In the utilization of by-products obtained from the manufacture of gas, practically all of them have come into some use except spent purification oxide. This material is considered in general to be a waste product and having done the required work, is thrown on the refuse heap, especially that used in carbureted water gas purification, stated Edward J. Murphy, assistant chemist of the Brooklyn Union Gas Company, in his paper on "The Removal of Sulphur from Spent Oxide," presented at the recent annual convention of the American Gas Institute at Chicago.

While the costs involved in gas purification are not the largest in gas manufacture, he continued, it nevertheless occurred to the writer, that if the free sulphur in spent oxide could be removed economically it could be used again for purification purposes, instead of being thrown away.

Coal Tar Distillates Dissolve Considerable Amount of Sulphur at Their Boiling Points

It has been shown by Pelouze that distillates from coal tar dissolve considerable amounts of sulphur at a temperature approaching their boiling points, while at ordinary temperatures only a small percentage is dissolved.

The absorption of sulphur occurs notably with the heavy oil distillates (200-300 deg. Cent.). Recently a patent was obtained in France for the extraction of sulphur and nitrogen from spent oxide. In this process the patentees use coal-tar distillate heated to 100 deg. Cent., the minimum boiling point of the oil used being somewhat higher.

As water gas tar was all that was available to the writer it became necessary to determine whether distillates of this type had the same property of dissolving sulphur. Accordingly a large sample of water-gas tar was distilled up to 225 deg. Cent. and then redistilled and cut at the following temperatures above 150 deg. Cent.

Temperature deg. Cent.	Specific gravity at 20 deg. Cent.
150-160	0.8692
160-170	0.8743
170-180	0.8843
180-190	0.9023
190-200	0.9145

Each if these fractions was then treated with an excess of pure sulphur and slowly cooled to 20 deg. Cent. The sulphur crystallizing out, was filtered off and that remaining in solution was determined.

Table Showing Solubility of Sulphur at 20 Deg. Cent.

Distillate deg. Cent.	Grams sulphur in 100 cc. distillate at 20 deg. Cent.
150-160	2.60
160-170	2.69
170-180	2.80
180-190	2.94
190-200	3.33
150-200	2.74

These results are almost identical with those of Pelouze, who used coal-tar distillates.

Extractions were then made on some of the coarsely ground spent oxide using a Gooch crucible in a Ford-Wiley-Soxhlet extractor, and a paper cartridge to hold the oxide. In order to obtain results that were comparable each sample was extracted for 45 minutes with the distillate. The crucible was then withdrawn and the oxide washed twice with toluene, three times with ether, dried at 105 deg. Cent. and weighed. The results are tabulated herewith.

Distillate deg. Cent.	Per cent. extracted, sulphur and tar	Per cent. sulphur in extracted sample
150-160	53.35	7.40
160-170	54.93	6.98
170-180	55.97	6.30
180-190	56.32	5.92
190-200	56.39	6.11

The original oxide contained 52.15 per cent total sulphur. Only the result of one extraction with each distillate is shown, as the above sample is a fair average of all that were treated.

Large Samples Used

For the purpose of showing the performance of an extracted oxide, with respect to its fouling properties, large samples of oxide and correspondingly large amounts of the entire distillate (150-200 deg. Cent.) were used. The oxide was first air dried but not ground and the extraction was made in a simple tin percolator containing a fine wire mesh sieve and a piece of muslin, which is necessary to prevent the iron oxide from running through with the oil, after its removal from the percolator. The oil and oxide were mixed together and heated to 100 deg. Cent. and this temperature held for five minutes. The oil was allowed to flow out through a cock at the bottom of the percolator and cooled. After cooling, the extracted sulphur which crystallized out very readily was then filtered. The oil was used again for a second extraction on the same oxide. Each oxide was extracted twice and finally freed from oil by passing slightly warmed air over it. In the results shown below extractions were made with water-gas tar distillate (150-200 deg. Cent.) and the fouling tests were done according to the Kuneberger method.

Sample	1	2	3	4	5	6
Oxide, grams	100	100	200	500	500	500
Distillate, cc.	300	300	500	1,500	1,500	15,00
Sulphur remaining after extraction per cent	6.46	6.48	7.11	6.90	7.54	6.26
H_2S Absorption						
Change 1	12.54	15.00	22.43	16.41	18.09	13.51
Change 2	12.79	13.05	20.00	15.12	15.02	13.10
Change 3	14.83	12.01	11.18	11.44	14.02	14.65
Change 4	8.71	10.40	6.27	9.20	11.76	11.21
Change 5	7.86	8.21	4.11	7.41	8.12	7.72
Change 6	8.89	6.46	4.25	5.05	3.04	6.21
Change 7	5.45	4.09	3.61	5.12	2.02	2.86
Change 8	2.11	1.48	0.42	3.12	0.77	1.01
Change 9	1.87	0.63	0.61	3.00	1.12	0.59
Change 10	0.92	0.72	0.33	2.46	0.91	1.19
Total	75.97	72.05	73.21	78.33	74.87	72.05

By the results shown above it can be seen that the avidity for hydrogen sulphide of an oxide after being treated compares favorably with any good oxide. It might be stated here that all the samples treated were precipitated oxides. It is also to be noted that the percentage of unextracted sulphur is a practically constant figure. Just how many times a spent oxide could be treated and used the writer is not ready to state. Lack of time prevented the working out of this important point.

Results Attained On Laboratory Basis

It must be borne in mind that the results given in this paper are all made on a laboratory basis, and, of course, not much can be said, at this time, of the economics of the process. The various costs for apparatus, labor, etc., have to be taken into consideration, but the material necessary for the extraction is to be found right in the works. This can be used over and over again; it is only necessary to redistill the oil when the amount of tar, which is also extracted with the sulphur, becomes troublesome. The writer hopes to be afforded the opportunity to try the process on a working scale, as it is believed to offer possibilities.

Omission of Piping for Gas in Large Buildings Due to Lack of Effort of Gas Companies

The report of the Committee on Supplying Large Buildings with Gas, of which Oscar H. Fogg is chairman, at the recent annual convention of the American Gas Institute, indicates clearly that there still exists a demand for gas in these buildings for many purposes; that the possible applications of gas to the uses of tenants of such structures is increasing; that the cost of providing the necessary piping system to supply these demands is comparatively negligible, and that the omission of such systems is principally due to the lack of activity on the part of gas companies in compelling the recognition of the advantages of and demands for gas supply, and further, that where proper activity has been brought to bear upon the situation, the results obtained have fully justified the effort made.

Gas Properties a National Asset of Prime Military Value

William E. McKay, in Presidential Address before American Gas Institute in Convention at Chicago, Declares Experience of Present War Has Demonstrated This Fact—Gas Making Not a Process of Destructive Distillation of Coal, but, on the Contrary, a Process of Conservation that Places Industry in Vanguard of this Praiseworthy Advancement

The experience of the present war has shown that gas properties are a national asset of prime military value, declared William E. McKay, retiring president of the American Gas Institute, in his address at its annual convention, held recently in Chicago.

Modern warfare requires enormous quantities of high explosives. As they cannot be stored in large quantities, the capacity to manufacture must exceed the possible average daily consumption.

Gun-cotton and smokeless powder are made by nitrifying cotton; all high explosives are made by nitrifying toluol, phenol, and other by products of gas manufacture. The nitrifying agent, nitric acid, can be readily made from ammonia.

It is stated that in England alone the present daily make of nitrate of ammonia is 600,000 lb. Many hundreds of European gas companies are now recovering benzol and toluol for use in high explosives. To meet the extraordinary demand, by-product coke oven plants in the United States will this year produce many millions of gallons of these products.

Gas Making a Process of Conservation

It is no longer sufficient to describe the process of gas making as the destructive distillation of coal. On the contrary. it is a process of conservation that places us in the vanguard of this praiseworthy advancement. In the field of agriculture our ammonia is now serving the needs of peace; its conversion into nitric acid to serve the needs of war is facile, reasonable and economical.

At the Richmond meeting, in 1913, the president stated: "The most important condition facing the Gas industry to-day is the increasing cost of materials and supplies, including materials for enrichment." This condition, with the inclusion of increasing costs for capital and for labor, is even more pressing in 1916. In Italy, in France, in England, in Germany, labor and coal are scant, the selling prices of gas have been much increased, extensions and construction have been deferred because money and men have been used in more urgent work, and women have taken the place of men in the works as well as in the office.

These occurrences foreshadowed their counterpart in countries at peace. On all sides we already hear lament over the scarcity of labor. Not only are there less workmen, but there is an observed decrease in the efficiency of labor. Wages are more and the work performed is less.

With smaller outputs the mine prices of coal have greatly advanced. The depredations of submarine warfare, and the heavy export trade, have so reduced available tonnage as almost to triple the cost of coastwise water transportation. Rail rates are scheduled to go higher.

Other and similar causes have in like manner increased the costs of machinery, apparatus, oils, and everything used in our manufacture. Even with higher costs, raw materials are not everywhere abundantly procurable. Modern government costs more, and the multiplication of statutes does not facilitate business.

Gas is not yet in step with the upward march of the cost of living. For a hundred years we have successfully striven to give better service and ever at lower prices.

We may need to readjust our perspective, and to unite our efforts for the maintenance of satisfactory service at higher prices for our prime product. It is the time for better and closer cooperation with each other, and with our customers, among our companies, between our associations and with the State and Federal regulating bodies.

Work of Institute Has Justified Expectations of Its Founders

In the ten years of its life the work of the Institute has abundantly justified the expectations of its founders. Its enduring contributions to the helpful knowledge of the industry have been large in volume and high in value.

The conceded excellence of the technical work of the Institute was a continuation of the accomplishment of the associations from which it was formed, but the establishment of the Public Relations Committee was a prophecy of which the event is full of honor. The serviceable activity of this committee has grown prodigiously, especially since it became permanently constituted, with a secretarial member whose technical and professional qualifications are eminent.

In the Technical Committee there has been an advantage from rotation in office; but in the Public Relations Committee the conspicuous advantage has resulted from the continuity of voluntary service which has steadily widened the sphere and elevated the plane of the authoritative influence of the Institute in public relations.

The original program contemplated co-operation with state and other associations by virtue of mutuality of technical interests, but the energizing basis of real co-operation has developed from Public Relations, as is evidenced by the history of affiliation. In 1908, the Illinois, Wisconsin and Iowa Associations affiliated with the Institute and Pennsylvania in 1912. Since September, 1915, the Southern, the New Jersey and the New England, Indiana and Michigan Associations have affiliated, and other associations look towards affirmative action.

The formation of new associations and the establishment of educational facilities proceeds apace: The Texas Association, the By-product Coke Producers, the American Gas Industries; a Gas Research fellowship at the University of Illinois, a course in Coal Gas By-product Recovery at Johns Hopkins University, and by the Massachusetts Institute of Technology, a branch school of instruction in Chemical Engineering as related to gas. In February, the Directors adopted a resolution expressing appreciation of the work being done by colleges and universities in establishing courses and laboratories for the study of gas engineering. We need to co-operate effectively with every other association and with every activity that has the welfare of the gas business as its object.

Income Has Doubled

Since 1906, the income of the Institute has doubled. The membership has increased from 1215 in 1907, to 1525 in 1915, a total addition in eight years of 310 members. In this same period the Institute membership from the six Eastern states of Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Pennsylvania, increased from 564 to 874, or by 310; while in the seven states of Ohio, Indiana, Illinois, Michigan. Wisconsin, Iowa and Missouri it decreased from 401 to 346, or by 55 members. It is a favorable augury that in 1916, 55 new members have been elected from these seven states. We earnestly desire the numerical and financial support that are essential to the broadcast success of the Institute in its aim to be everywhere and in every way helpful to our industry.

Notwithstanding the large increase in annual dues, this year closes with a net gain of 102 members. This can be regarded as a satisfactory endorsement of the policy adopted for increasing our income through raising the dues, and testifies approval of the work already accomplished, and betokens confidence in the future work of the Institute.

One of the qualifications for membership concerns employment, usually in a company whose prime or by-product is gas. These companies and our own members have generally assisted the professional and practical work of the Institute, defraying the expenses of investigation, compilation and research subsequently contributed to our proceedings, and carrying the charges of attendance and participation in committee work involving expenditures that would otherwise demand appropriations of the Institute. It is seldom that support in men and money have not been promptly forthcoming for work where there is agreement as to need and imminence.

The scientific preparation and probationary experience that have become preferential in the engineering branches can, with equal efficacy, be applied to the sales departments, where, when joined to the art of salesmanship it will, like steel in concrete, fix the

foundation and stabilize the structure, and will insure and accelerate satisfying returns.

Experience has demonstrated that the composition of our membership, and the effective exercise of our functions has established and can maintain our prestige; and that the Institute can and will continue to be accredited as the premier basis of authoritative reference in the affairs of our vocation.

Many of the members know the Institute only through the Monthly News and the Annual Meeting. The reports of the Board of Directors and of the General Committees set forth the principal business transacted during the year. To those who have participated in the work of the Committees on Arrangements, Technical Programs, and Public Relations, we are each year indebted in a greater degree. In its own office, and through its affiliations, the Institute work is steadily growing in volume and in worth. The office work has increased so much that this year, finances permitting, the Directors appointed an assistant secretary. The new quarters of the Institute have satisfactorily provided convenient accommodations, and have been used with greater frequency for meetings of the directors of various committees. The expansion and committee work is indicative of more general participation by members, and of constantly improving accomplishment.

Promise of Bright Future for Young Men Entering Industry

The census report for 1914 shows, for five years, 35 per cent increase in the sales of gas (exclusive of coke oven gas); the inevitable growth of our business has abundant cause for felicitous encouragement. The young men who, in large numbers, are now aligning themselves in our ranks face a future full of promise of exceptional opportunity and compensating success. We welcome them heartily, confident that their energy and ability will support and promote the morale and the material prosperity of our profession.

It is appropriate to manifest our esteem and respect for the fourteen members whom we have lost by death. Benjamin W. Perkins, as President of the Ohio Association, became the first President of the Institute in 1906, and served in that capacity at the initial meeting in Chicago ten years ago. In the list of those whose work is finished are Sir Corbet Woodall, an honorary member, and D. S. Knauss, a junior member; the former after a long life full of achievement and honors, the latter at the threshold of a career which held a hopeful assurance of high attainment.

Price the Only Factor That Stands in Way of Universal Use of Gas for All Industrial Purposes

The only thing that stands in the way of the universal use of gas for all industrial purposes is the question of price, asserted F. S. Wade, of the Coast Counties Gas Company, of Los Angeles, Cal., in his paper on "Commercial Problems of the Day," presented before the recent annual convention of the Pacific Coast Gas Association, held recently at Santa Barbara. Gas in order to be used in any industrial work must at least approach the price of other fuels and, as the consumer becomes larger, the cost of gas must nearly meet its competitors.

Up to very recent times the general use of the unscientific "straight" rate has stood in the way of great advanees in the use of gas for industrial purposes. There are now, happily, signs that the gas industry is awakening to the fact that it needs rates varying with the quantity consumed and the load conditions as much as any other utility. We used to flatter ourselves that because gas could be easily stored we need not be concerned with the load problem, but just make gas and put it in the holder until needed. The advent of high pressure transmission lines supplying communities remote from the point of storage has shown us the folly of this position. We now realize that the peaks in the gas business are quite as sharp as in any other and so we can profitably serve industrial consumers using gas during the off peak periods at rates very much below those given the on peak domestic consumers.

Industrial gas appliances have been developed to a high state of excellence. The men engaged in our industrial departments are of the best in the business. The pressing need, then, in this field is a scientific study of quantity and demand costs so that rates can be fairly adjusted to meet the requirements of this great class of potential consumers.

Too Much Attention Being Given to Cost-of-Service Idea in Rate Making

To Take from Corporations the Natural Fruits of Efficiency Creates A Sense of Injustice, Which Paralizes Effort, Invites Inefficiency and Produces Slipshod Management

In the matter of rates, too much attention is to-day being given to the cost-of-service idea; in fact, if it costs a certain amount to deliver to a consumer 1,000 cu. ft. of gas, it is assumed that that is a fair rate, irrespective of whether that gas is being manufactured and delivered economically or not. The regulation of to-morrow is going to concern itself a great deal with the operation of the utilities. To quote from a statement of Mr. Brandeis, now an associate justice of the Supreme Court, which he made in appearing before the Interstate Commerce Commission in the so-called Rate Advance cases: "To-day efficiency in management is in danger of being punished, where it should be rewarded. Efficiency is naturally reflected in large net earnings, and as no ready means exist for determining whether greater net earnings are due to greater efficiency in management, or to higher rates, large earnings are frequently accepted as evidence that rates are too high, and invite a demand for reduction; whereas, in fact, the large earnings may be due wholly to better judgment, greater efficiency and economy in administration. To take from corporations the natural fruits of efficiency—that is, greater money rewards—must create a sense of injustice suffered, which paralyzes effort, invites inefficiency, and produces slipshod management.

To quote from another man, Arthur T. Hadley, who has given a great deal of study to the matter of the profit which should be allowed a public utility: "No attempt should be made by statute to limit railroad profits to a fixed percentage, or to treat a high cash dividend as necessarily indicating extortion. Railroad charges must be reasonable; but to try to control rates by arbitrarily limiting profits is to put the manager who makes his profit by efficiency and economy on the same level as the one who tries to accomplish the same result through extortionate charges."

Incentive to Increased Efficiency Needed

The old idea of regulation by law in which the rates were considered as fair, provided they did not result in the confiscation of property, is wrong, as it does not give encouragement to efficiency of management.

If the profit of a utility is to be limited to a definite rate of interest irrespective of whether it is efficiently managed, or not, it is but natural that there will not be the incentive for increased efficiency in operation.

With regulation under a commission, as is now being done, rates should not be fixed based on a company earning a certain definite income; the amount of that income should be variable and it should lie within the power of the commission to decide it, based entirely on the efficiency of the operation of the utility.

This can be done as a commission is in a position to find out whether a company is being efficiently operated or not, and if it sees that a company is improving its methods of operation; is taking the initiative in formulating schedules of rates which will tend to increase its business, so as to reduce its cost, it will be able to allow a higher rate of return than to one which is lying dormant, and is simply taking the business being offered to it.

These statements were made by S. Waldo Coleman, manager of the Coast Counties Light & Power Company, in a paper presented before the recent annual convention of the Pacific Coast Gas Association. Mr. Coleman stated further that:

Possibility of Government Ownership

There is one big advantage which Government owned utilities have over privately owned, and that is in the cost of money—and one of our largest items in the costs of operation is the cost, or, in other words, the interest on the money needed to construct our utilities. For instance, the cost of money to municipalities lies between 4 per cent and 5 per cent generally, as against between 7 per cent and 10 per cent for a privately owned utility, and the only way that private ownership can be held as being more advantageous to the public than Government ownership is in the exercise by these private utilities of increased efficiency in operation. A big factor in increasing this efficiency is to be willing to take the initiative in adopting new methods after proper analysis, and making sure they are correct. Rate making is one field for applying this increased efficiency.

LINE CARRIED ACROSS RIVER IN TWO COFFERDAM SECTIONS

Without an Efficient Organization to Carry Out Work as Planned, Progress is Not Possible

Cheerful and Receptive Attitude of Personnel Towards Progressive Ideas Which May Be Imported Essential—Discipline a Prime Necessity—Rights and Privileges of Employees Should Be Respected

Without an efficient organization to carry out the work as planned progress is not possible, stated E. L. Hall, chief engineer of the Portland (Ore.) Gas & Coke Company, in his paper on "Efficiency Methods in Public Utilities," presented at the recent annual convention of the Pacific Coast Gas Association at Santa Barbara, Cal. Likewise, of the greatest importance is a cheerful and receptive attitude of the personnel towards the progressive ideas which may be inaugurated.

There are certain essentials for the creation of such a favorable medium.

The most important of these is certainly discipline.

Military organizations, whose very existence depends on the accuracy and faithfulness with which orders are carried out, and personality subordinated, have from time immemorial laid the utmost stress upon this factor. The essential to discipline is an iron-clad respect for the jurisdiction of heads, and the rights and privileges of employees.

It has been rightly said that no man may serve two masters. One of the first essentials towards a smooth running organization is for any employee to know that his job depends on his boss, and not on some one higher up.

It also follows, when such jurisdiction is solidly established, that leniency and loyalty towards subordinates on the part of the heads should result. Those in authority, in order to command respect, should always issue instructions without reference to their source of origin, and should insist upon a prompt and scrupulous observance of them.

No organization, which depends principally upon so-called cooperation and good fellowship to offset the lack of clean-cut jurisdictions and well thought-out rules and regulations, can really succeed.

Compromises and a *laissez faire* attitude amongst employees reflect, not a desirable condition, but an absence of organization and direction.

It must not be understood however, that rules and regulations should not be interpreted with common sense and good feeling, but rather that, if discrepancies occur, they shall at once be referred to those capable of rectifying them in a permanent manner. For this reason one of the first steps in efficiency work is the compilation of rules and regulations for the conduct of the business, to be incorporated when completed into an organization manual. Such a manual forms the source of authority for all disputes and should be frequently amended and kept up to date by entrusting all changes and additions to some special employee.

Welding of Joints Facilitates Work of Laying Main Across Du Page River

No Special Fittings Required Other Than Those Made in Field—Line Carried Across By Means of Two Cofferdams

By EDGAR E. LUNGREN,
Western Gas & Electric Company, Aurora, Ill.

The accompanying photographs show how an 8-in. welded main was laid under the Du Page River near Aurora, Ill. The river is about 70 ft. wide and from 2 to 3 feet deep, and, owing to the fact that it was to be dredged subsequently, it was necessary to lay the pipe 4 ft. below the river bed.

A coffer-dam was built half-way into the stream and the 5-ft. offset shown was cut and welded on the road, using four pipe lengths. The offset was slid into position and held with chain blocks while the tie-in was made.

OFFSET MORE CONVENIENTLY MADE BY WELDING THAN IT COULD HAVE BEEN BY FIRE-BENDING

A Dresser cap was fastened to the end of the main with setscrews, and after testing, the section was lowered into the ditch.

The coffer-dam was then opened and another one built on the opposite side of the stream to include the stub end of the pipe.

Another offset similar to the one mentioned was made above the ditch, lowered into position and welded into the stub end below the bed of the river. Aside from this tie-in, all welds were made above the ditch.

This job is an example of how easily unusual jobs in main constructions may be made by oxy-acetylene welding and cutting. In this work no special fittings were required and the offset was much more conveniently made by welding than it would have been by fire-bending.

The work was done by the Western United Gas & Electric Company, for which C. C. Boardman is superintendent of distribution.

Astronomical Expert Terms Daylight Saving Idea Impracticable

Professor E. C. Pickering, director of the astronomical observatory of Harvard College, brands the "daylight saving idea", by which clocks would be advanced one hour so that work would be begun earlier, as a measure of self-deception, a mere "trick to deceive the ignorant for a time."

"Not a single scientific society or other body with expert knowledge has supproted the idea," he says. "It would be certain to result in confusion and danger. Its principal value appears to be that we might deceive children so they would go to bed at 8 o'clock and think they were sitting up until 9."

A committee of the Boston Chamber of Commerce recently investigated the merits of the proposal, and held a public hearing. Arguments were advanced on both sides, but lighting interests made no appearance, though a labor representative pointed out that employees of gas and electric companies would likely be adversely affected by the scheme.

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A Future of Exceptional Opportunity Promised Young Men Entering Gas Industry

Attracting young men of the proper calibre to its ranks is just as necessary to the future prosperity and advancement of the gas industry as is the stimulating of interest in improvements to present-day equipment and methods. That those who have attained high places in the industry appreciate this fact was amply demonstrated in the allusion made by William E. McKay in his presidential address at the recent annual convention of the American Gas Institute.

"The young men, who, in large numbers, are now aligning themselves in our ranks, face a future full of promise of exceptional opportunity and compensating success," declared Mr. McKay.

What more could the ambitious young man ask? Men of this type do not desire beds of roses already prepared for them. They expect and desire to work for the success they look forward to. All they ask is that they be assured that the reward is actually there to be attained, if they but possess the essential talent, and expend the energy required to attain it.

Words of assurance that the possible reward is an actuality, coming from so authoritative a figure as Mr. McKay, will have a potent influence on such men. Uttered as they were before so large a gathering of men of recognized standing in the gas industry, and bearing, as it might be said they did, the stamp of approval of so highly esteemed a body as the American Gas Institute, their influence in attracting young men to the industry must, of necessity, be immeasurably increased.

This journal rejoices that the retiring president of the American Gas Institute saw fit to include these words of assurance to the young man in his address. The result of their inclusion will, it feels certain, prove such as to amply justify their utterance.

Cast Iron Pipe Joints

The report of the Committee on Cast Iron Pipe Joints, submitted to the American Gas Institute at the recent Chicago meeting is interesting and valuable, but inconclusive. Full appreciation of the importance of the problem is shown in the recommendation by the present committee that "A committee be appointed to continue the work and present a final report at as early date as possible." That such "final report" may present a satisfactory solution of the problem is certainly the earnest wish of the older men in the gas industry who have for years recognized and appreciated the economy in the use of cast-iron pipe from a standpoint of main depreciation.

In low pressure systems the loss of gas from joint leakage has been practically negligible, but with higher pressures, the problem of holding the gas at the joints has become of prime importance. The ordinary lead and jute joint will not hold gas under high pressures, and, if cast iron pipe is to continue to hold its rightful place in the gas industry, a better type of joint must be devised.

It will be admitted by the makers of cast-iron pipe themselves that it is not in accord with good mechanical practice to use lead or any other soft non-resilient material in contact with a rough or unfinished casting surface, especially where such surfaces are subject to more than movement under the forces of expansion and contraction.

Aside from welding, which of course is not to be considered in cast-iron pipe, the ideal method of making connections would seem to be with threads and couplings, but threaded cast-iron pipe with rigid couplings has not proven successful for underground work, owing to the breakage from deflection and the stripping of threads under expansion and contraction, due to the low tensile strength of the cast iron.

With the modern development of automatic machine tools, this joint problem might be solved, particularly on the smaller sizes, by the use of a more or less flexible coupling, properly designed to take care of expansion and contraction, with machined surfaces where the iron comes in contact with the soft metal gasket; such coupling to be made in a thoroughly mechanical manner, and tested for tightness before leaving the factory. The only field work then necessary would be to screw the pipes together. The cost of such a coupling would problably not exceed the cost of the average type of awkward and make-shift clamps used by many engineers now, and which, after all, do not solve the problem.

The basic fault of the present bell and spigot type of joint is

in the principle of the joint itself, and cannot be corrected by the application of any external device.

A further investigation and recommendations of the American Gas Institute Committee on Cast Iron Pipe Joints will be awaited with much interest, not only by the members of the Institute themselves, but also by the makers of cast-iron pipe whose interests are evidently very much involved in this problem.

Why Should We All Use Mantles?

In a comment in regard to the recent proposals of the Peoples Gas Light & Coke Company in seeking to reach an amicable adjustment of the differences existing between that company and the city of Chicago, Prof. E. W. Bemis is quoted as asking the question: "Why should we all have to use mantles?"

Aside from the fact that we save money—oftentimes advanced as a forcible argument—and that we get better lighting thereby, this journal can see no logical reason why we should be compelled to adopt these modern contrivances.

But we are living in an age of compulsory hardship. If we desire to make a long distance inland journey, we are compelled by necessity to make it in a comfortable, fast-moving train. We are not privileged as were our forefathers to make it in a stage coach. That is, if we are of the large class of people of moderate means. Inordinately wealthy people can afford to gratify freakish whims.

Though the desires of the gas company in this matter of replacing Chicago's large number of open flame burners with mantle lamps may seem unreasonable, it must be conceded, in justice to it, that other utilities are twice as arbitrary.

It may be that Prof. Bemis was misquoted. We hope he was. If not some lighting company might render him a valuable service by mailing him some literature in regard to the advantages of using mantle lamps. This journal admits that his question is a poser, and awaits with interest to see how the Chicago company is going to get around it.

The "Intense Competition" the Gas Industry Faces

Holding the cudgel of the "intense competition" the gas industry faces, over its head as a means of stimulating activity along the different lines of endeavor their respective advocates are endeavoring to push is becoming a trifle monotonous. During almost its entire existence, the gas industry has been facing intense competition. When it wasn't electricity, it was kerosene. In the range field it has been the competitor, and such is its status in the new field—industrial fuel—which is at present opening up. Yet it has not only survived, but it has prospered, and is to-day so much greater as an industry than it was even so short a time as five years ago, that the expression "the danger of intense competition" sounds almost absurd.

This competition has been the greatest factor in the industry's progress. It made the Welsbach mantle inevitable. If it had not been Welsbach, it would have been some other. The reward was there to stimulate the activities of the inventor. To have held its lighting business with the inefficient and costly open flame burner against the competition of electric lighting, would have been impossible, and it is certain that the industry would not have passively permitted its lighting load to be taken away from it.

The gas man is a good fighter, and an energetic competitor. His trouble has been, not a reluctance to fight, but a tendency not to take competition too seriously until it actually began to hurt him. He is not the least bit frightened by the threat of competition, but is ready in combating it when it begins to look dangerous.

We have been subjected to competition in the lighting field, and will continue to be subjected to it, but our lighting business has continued to increase and will continue to increase even if we do nothing more than follow out the lines along which we have been travelling up to the present. But the industry will not be satisfied with this. It wants to advance in the lighting business by leaps and bounds. That is why it is interesting itself in new methods, and is constantly studying to make betterments in its lighting equipment.

In the cooking field, we are not in great danger of losing even a small proportion of our business. This despite the fact that though we have or can make highly efficient ranges, those most commonly in use are of such kind as to prompt the editor of one of the great technical journals in another field to assert that the gas range is about the most inefficient tool of modern business. Yet gas for cooking is to a large extent a competitor against other fuels and is itself subjected to competition. How much greater we could make our cooking load, should we really set ourselves out to do it, is evident even to the most superficial observer, and the reward to be attained by the effort more than amply justifies us in making it. Yet, even as we are, with all our shortcomings, gas for cooking will continue to increase in importance and will not be forced out by this so-called "intense competition."

Gas for industrial fuel is a field of alluring promise. We should not look upon it, however, as a substitute for other fields we have lost or will lose, but as an additional load, something hitherto undeveloped, which will make of the gas industry, already great, a much greater industry.

House Heating

The gas business has always been in a position to develop some new field of revenue as soon as any of its existing fields have been threatened. One field now awaiting such development appears to be that of house heating. Any gas company which will make a thorough survey of the district it serves will be very agreeably surprised at the possibilities it finds exist in this, as yet practically untouched, source of revenue.

Regardless of how low the cost of coal, how cold the winters and how high the gas rate, there is almost sure to be special cases where gas will prove more satisfactory, and, in the end, more economical than any other form of fuel. Among such cases will be found the following: Churches where services are held only on Sunday, and, perhaps, one evening a week; lodge or club rooms where only two or four meetings per month are held; court rooms in small or law abiding communities where it is necessary to hold court only a few times during the month; residences in the suburbs which are occupied only for week ends, and various other cases where heat is required for comparatively short periods and ease of control and quick response are essential factors. The revenue which can be derived from such loads is surprisingly large. There is considerable diversity to it and in most cases the greater part of it is off the present gas peaks.

There has already been enough experimental work done along the line of house heating to supply all the data that is necessary to secure this business. As a result of these experiments a sufficient variety of house heating systems have been developed to make it unnecessary for the gas company to build any special equipment to take care of any of these special cases. Usually standard equipment can be found that will give perfectly satisfactory results and at a cost for equipment that is not greatly if any in excess of the cost of the equipment required to do the heating with other fuels. This field is so full of promise that it is certainly worthy of development.

Veterans of the Industry Should Write for the Instruction of Its Younger Men

Elsewhere in this issue we print an extremely pertinent letter from one of our readers. Our correspondent apparently is of the opinion that the older men of the industry are somewhat lax in discharging their proper obligations towards its younger men, at least insofar that they have failed to disseminate knowledge amongst them to the extent they should, at weekly intervals through the medium of the technical press, and is somewhat skeptical as to the technical value of the writings of the younger men.

In the first of these particulars this journal agrees entirely with its correspondent. The older gas man has indeed been lax in the matter of contributing to the technical press. He owes it to the younger man, and to the industry, to exert himself to a much greater extent in this particular.

It is to the young man that the industry must look for the bulk of its original ideas, and, without originality, no industry can progress. It is true that the ideas he puts forward may, in some cases, be replete with weak spots and require the counsel of a more mature experience to round them out. But it is the germ of the idea that is of the greatest value. The rounding out and development process follows as a matter of course.

The ideal condition would be to have the young man present the ideas and to have the older men discuss them and criticize them constructively. But this condition possibly will never come to pass. For this reason the only practical course the technical journal can follow is to endeavor to keep a proper balance between the published articles of the older and the younger writers.

Publications

BROWN PYROMETERS.—Catalogue 10; paper bound; 72 pages; illustrated. Lists and describes the pyrometers indicated, their manufacture and their uses.

STATISTICS OF PUBLIC UTILITIES FOR THE YEAR 1914.—Cloth-bound book issued by the Board of Public Utility Commissioners of the State of New Jersey; 352 pages. This volume of statistics, the fourth to be published by the board, was compiled from the annual reports for the year 1914 of all classes of utilities that render reports for the calendar year, of which the total number was 450, comprising 36 utilities engaged in supplying gas at the close of the year, including 2 acetylene and 2 gasoline gas plants; 54 private and 13 municipal electric light and power utilities, 37 non-operating gas and electric companies, 122 private and 73 municipal water utilities, 15 sewer companies, 37 telephone utilities, and 24 operating and 39 non-operating street or traction railways. The exact number of separate companies and municipalities contained herein is 431, there being included twice 4 companies engaged in both gas and electric operations during 1914, four which carried on an electric light and power business in addition to that of supplying water, one water company also operating both a gas and a sewer plant, and 9 municipalities engaged in electric operations as well as supplying water. One private electric light and power plant and three private water utilities were unincorporated at the close of 1914, and among the above 122 are also included two which were non-operating companies during the year and three which operated sewer plants in connection with their water supply systems and which are not included among the 15 sewer companies mentioned above. The total capitalization of gas companies in the state is given at $92,990,000, of which $44,850,000 represents funded debt. The gross revenue of the companies totalled $13,070,000 and the net revenue $5,380,000, which is 5.79 per cent of the capitalization. Forty-one per cent of the gas companies paid dividends and the total dividends averaged 7.3 per cent on the par value of the total capital stock. Only one gas company showed a total gross revenue exceeding $1,000,000, this being the Public Service Gas Company with an operating revenue of $10,320,536. The average operating expense per 1,000 cu. ft. of companies selling less than 100,000,000 cu. ft. of gas per annum is given as 76.55 cents, that of those selling between 100,000,000 and 1,000,000,000 cu. ft. per year as 51.99 cents and that of the only company in the state selling over 1,000,000,000 cu. ft. per year as 44.97 cents. In addition to statistical matter the volume contains a brief history of the various companies and the names of their officers.

Reasonableness and Legal Right of the "Minimum Charge" in Public Utility Services

Authur, Samuel S. Wyer, consulting engineer. Paper backed; 6 x 9 in.; 20 pages. Published by American Gas Institute, George G. Ramsdell, secretary, 29 W. 39th St., New York City. Single Copy, $1; 25 copies, $20; 100 copies, $50; 500 copies, $200.

Is a work highly indorsed by the American Gas Institute, which states that "every gas company is vitally interested in the facts contained in Mr. Wyer's paper and should be familiar with the arguments set forth therein. The public they serve should know them as well, that the many erroneous impressions existing to-day with regard to minimum charges may be corrected."

The book shows the use of the "minimum charge" in Public Utility Rate Schedules, and has presented in a forceful and logical manner the arguments in favor of the "minimum charge," and contains two alphabetical tables, showing the adjudicated and non-adjudicated monetary allowances for minimum charges in existing rate schedules.

The necessity of the "minimum charge" to prevent discrimination and compel each class of consumer to pay for the service it is receiving, is demonstrated, as well as the fact that there are ample precedents for making the "minimum charge" proportional to the size of the consumer's demand for service. The various decisions underlying these principles are also quoted.

The subject of gas rates and the establishment of schedules that will prove absolutely fair to all consumers, and give a proper return on the investment of the company is one of the most important questions before the industry to-day. This book will supply the gas man with the basis of strong arguments in favor of such schedules, and, for that reason, cannot fail but serve a very useful purpose.

The American Petroleum Industry

Authors, Raymond Foss Bacon, professor of the Mellon Institute of Industrial Research of the University of Pittsburgh, and William Allen Hamor, assistant to the director of the Mellon Institute of Industrial Research. Cloth Bound; 2 vol.; 963 pages; illustrated. Publisher, McGraw-Hill Book Company, Inc., 239 W. 39th St., New York City. Price $10.00 net.

The authors' purpose in preparing this work, as announced in the preface, is to present a comprehensive survey of the American petroleum industry, suitable not only as a general reference work for those engaged in the industry, but also as a text-book for students of petroleum engineering. In the opinion of the reviewer they have succeeded in producing an exceedingly valuable treatise, though somewhat voluminous. But, unless one considers the "those engaged in the industry" to mean only technically trained men, they have failed somewhat in attaining the ideal they have set for themselves. In other words, the volumes, except in parts, are not written in the language that will appeal to the non-technical mind.

The first volume deals with the geochemistry, the geology, and the physical and chemical properties of petroleum, and its distribution in this country. Also with the history of the industry in this country, the distribution of the mineral, oil well technology, valuation of oil properties, possible causes of the decline of wells and suggested methods of prolonging yield, efficiency in production, and the condensation of gasoline from natural gas. The second volume covers refinery practice. The subject is ably handled and the matter well presented. An improvement would have been effected, we think, had the same amount of information been presented within a smaller compass. The space devoted to petrologenesis could, in our opinion, have been reduced by half.

The chapter on the history of the industry could have been reduced in space occupied by giving the data regarding the yields and profits obtained by various wells in a compact table.

The chapter on the geology of petroleum is particularly valuable. A good part of the chapter on oil well technology was doubtless given a place with a view to the needs of students in petroleum engineering.

Correspondence

Veterans of the Industry Should Write for the Instruction of Its Younger Men

Sir: I have noticed two or three editorials appearing recently written apparently for the purpose of encouraging young gas men to write for the technical gas journals. It seems that the young men in the gas industry are behind those in the electrical industry in this respect. I have no doubt but that the chief reason for this is that the subject of electricity is largely reducible to a number of mathematical formulae and consequently a young man, by sufficient application, can obtain a grasp on the subject in a comparatively short time. His ideas soon take form and when he writes he knows what he is "talking" about.

Compare this with the chaotic state of the knowledge on the subject of gas manufacture. What young man can be sure that he is right when he makes an original statement in regard to this subject? I think any man who has been in the business over ten years will agree that he has found it necessary to change and modify his ideas many times. Clear knowledge of the art is made difficult, too, by the conflicting claims and statements made by those whose real purpose is not to disseminate knowledge but to sell some particular material or apparatus.

What encouragement is there, then for a young man to prepare an article about something which he cannot prove conclusively, and which a riper experience may show to have been snap judgment and erroneous? Wouldn't the gas industry make better progress if more of the old men would do the writing so that the young men could profit by their experience, avoid their errors and begin where they leave off?

News of the Gas Industry

Two Floats, Twenty Service Cars, Three Motor Trucks and Ten Motor Cycles Represent Omaha Company in Industrial Parade Witnessed by Thousands

Larger of Floats Visualizes All-Gas Kitchen, Smaller Proclaims Company's Program of Continuous Performance of Good Service—Service Cars Emphasize by Repetition Words "The Gas Way" and "Gas Service"

If the residents of Omaha were not entirely convinced of the advantages of gas service after the industrial parade held in that city October 3, in connection with the annual "Ak-Sar-Ben" carnival, it was due to no lack of endeavor on the part of the Omaha Gas Company, of which W. H. Taylor is manager, to bring about that much desired result.

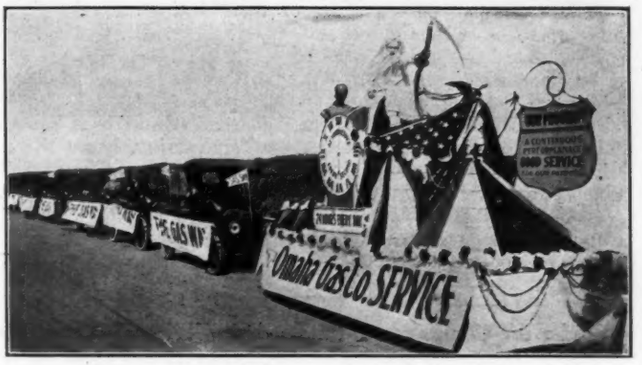
The company was represented in the pageant by two floats, twenty Ford service cars, three motor vans and 10 motorcycles. The floats were originated and prepared by William E. Davis, special service representative for the company. The larger one represented an all gas modern kitchen, while the smaller one, which headed the service department section of the parade, proclaimed convincingly the company's program of continuous performance of good service for its patrons.

BY MEANS OF PARTITION IN CENTER SIMILAR VIEW PRESENTED TO SPECTATORS ON EACH SIDE OF STREET

Following the floats came the twenty Ford cars, each carrying a banner on each side on which the words "The Gas Way" were printed, and in front, a pennant with the words "Gas Service" printed on both sides. These cars were followed by three motor vans and ten motorcycles, also adorned with banners. Most of the company's men wore special uniforms recently purchased, to be used in their work when meeting the public.

The pageant was witnessed by thousands of people, crowded along the downtown streets of the city. Many of the city's industries were represented in the parade, and with forty floats, portrayed its business life.

An all-gas modern kitchen was ingeniously shown on two sides by means of a partition dividing it in the center. On each side stood a woman demonstrator, showing the use of the various gas appliances. The service float was decorated in the national colors, the front end being draped with two large American flags, and an American eagle sat directly above them. It was equipped with two large signs representing the dials of a clock, which stated "At Your Service Every Second, 24 Hours Every Day." The clock idea was taken from a service float entered in the Baltimore Gas Centenary parade. Directly over the clock dial sat "Father Time" with his scythe and hour glass, and on the platform on the rear of the float stood "Sky-Gack" taking notes of the important events of the day. This figure is a character used a few years ago by the Omaha Daily News in a cartoon representing a person who had been sent down from Mars, to take down all important events, so that the idea to be conveyed was perfectly clear to most of the people who witnessed the parade.



SYMBOLIC FLOAT HEADS SERVICE SECTION

Many favorable comments were made by those who witnessed the parade in regard to the company's showing, and a large number were surprised to know that it had in use so many automobiles and motorcycles. It is felt that the undertaking proved a very good advertisement for the company.

Waycross, Ga., Opens $125,000 Plant

The new $125,000-plant at Waycross, Ga., was formally opened Oct. 10. At the city offices of the company a public reception was held. The gas company had many representatives present to demonstrate every thing that will be used in the gas line. Mayor Beaton put a match to the first gaslight in the presence of a large crowd.

New Gas Rates for Sterling, Ill.

The State Public Utilities Commission of Illinois has approved the new gas rates for Sterling and Rock Falls as well as the electric and power rates for Sterling. The changes will be made on the Nov. 1 bills, and many consumers will profit by them.

Montgomery Develops Good Gas Outlet

A large industrial gas load has been developed by the Montgomery (Ala.) Light & Water Power Company in the State Normal (colored) school in the city. The school has 700 pupils, 400 of whom take the domestic science course. The company has installed a large cabinet range and 24 domestic science hot plates. Mr. Bowman of the Montgomery business staff will lecture to the pupils on the use of gas. The company is at present working on another school prospect which it expects to close shortly. The sales of the Montgomery Company for September doubled those of the same month last year, with chances good of repeating for October.

Courts Cannot Overrule Decisions of Public Service Commission.

The Court of Appeals, in a decision that has just been received here, holds that the courts have no control over the Public Service Commissions of the State, that an order given by either one of the commissions to a corporation must be obeyed, and that the courts may not overrule the order unless it violates the law. The opinion was described by lawyers yesterday as of the greatest importance because it places corporations absolutely within the control of the commissions, and any appeal for a revocation of an order or for its modification must be made directly to the commission.

Free Maintenance Service for Appliances at Holyoke

The advantageous working of the recently inaugurated free maintenance service for gas appliances in the houses of customers of the Holyoke, Mass., municipal gas plant is reported by the department's manager, J. J. Kirkpatrick, who started this work, with four service men, to enable customers to keep their appliances in good working condition, and to keep them in service; the department thus being given the advantage of continuous consumption of its product.

Customers telephone their troubles to the office at City Hall and the service men visit the homes, making all repairs without charge, except where new parts are required, which are supplied at cost. Stoves are cleaned and put in first-class working condition, it being found that at least 75 per cent of stove troubles are due to the air mixture being wrong.

The repairmen have as part of their duties the sale of new ranges and other appliances, and these they install, together with Welsbach mantles, at cost plus 25 per cent for selling.

The department is now making 17 to 18 c. p. gas, and there are 8,500 lighting customers on its services. Though the city also operates an electric plant, the management's desire is to maintain, and to increase the use of gas for lighting, hence the use of the mantle is promoted in every possible way. The Holyoke plant is one of those in which tests are being made by the State Gas Commission, to secure data for use in setting a calorific standard. The plant capacity is about a million cu. ft. per day, the average output about 800,000, and the maximum 958,000 cu. ft.

Rochester Company Gains Over 3,000 New Customers

The Rochester Railway & Light Company, of Rochester, N. Y., gained 3,268 new gas customers during the past year according to figures recently compiled.

Toledo Cadets View Detroit Edison

The cadet engineers at Toledo enjoyed a pleasant trip to Detroit, Sept. 18. The private car "Toledo" of the Toledo Railways & Light Company, was used in making the trip, and points of interest visited in Detroit were the Conner's Creek plant of the Detroit Edison Company, and the gas works of the City Gas Company.

New Exhibitors Listed for Annual Convention of N. C. G. A.

The following firms have been listed as exhibitors, in addition to those published in last week's issue, at the annual convention of the National Commercial Gas Association to be held at the Hotel Traymore, Atlantic City, Nov. 14 to 17, according to information received from William W. Barnes, of Bayley & Sons, Inc., of New York City:

ACME STOVE AND RANGE COMPANY, CARNEGIE, PA.
REMINGTON TYPEWRITER COMPANY, NEW YORK CITY.
AMERICAN GAS LIGHT JOURNAL, NEW YORK CITY.
HOFFMAN WATER HEATER COMPANY. LORAIN, OHIO.

Lowell (Mass.) Gas Workers Met on Columbus Day

The Lowell Gas Workers Association held a smoke talk in their headquarters on Columbus day, with a large number of members of the organization in attendance. A feature of the occasion was the presentation by Harry Peters on behalf of the members, of a gold ring to Patrick Ward, who heartily thanked the members for the honor conferred on him, and assured them that he always would work for the best interests of the organization. The program was brought to a close by three cheers for the hero of the evening.

Entertainment Program for N. C. G. A. Convention Looks Tempting

Up to the present more than twice the largest advance reservation of any previous National Commercial Gas Association convention is on the books, and 200 ladies have definitely signified their intention of being present.

Chairman C. W. Wardell of the entertainment committee has outlined the entertainment for the convention. A notable feature of the plan is that each event calls for the presence of both men and women.

There has been no feature neglected, apparently, in planning the festival. Even the weather man has been consulted. He has shown that the records for the last five years conclusively demonstrated that November is Atlantic City's best month. If, however, the weather man should play false, the program will go on just as before, for all the events are to be held indoors.

The program embraces an event in practically all of Atlantic City's noted institutions.

The ladies' entertainment committee consists of every lady registered. This very diplomatic course will guarantee no disappointments. The men's entertainment ticket will be $7.00, and the women's $5.00. This covers the entire week's entertainment. An outline of the entertainment follows:

On Sunday evening, Nov. 12, there will be an informal greeting and an orchestral recital at Hotel Traymore.

On Monday there will be free rolling chairs for everyone wearing a convention badge, a golf tournament at one of Atlantic City's famous country clubs and trap shooting for men and women at DuPont's school. In the evening the President's reception will be held.

One of the nicest surprises of the trip is held in store for this event. The committee, wise in the ways of womankind, refuse to reveal any details except that the grand march alone will be worth a long journey. It is the desire of the committee to have every one registered participate in this function.

On Tuesday there will be a big carnival and social night. The ball room on Young's Million Dollar Pier has been engaged exclusively and more amusing and interesting features are planned than are ordinarily seen in a three-ring circus. Surprise stunts, burlesques, movies, dancing and a general merrymaking event of historical proportions is planned.

On Wednesday the ladies will be entertained by a luncheon at the Sea View Country Club. The trip to this famous spot will be made by automobile. A theatre party will be held in the evening. There is a special effort being made to have as the attraction, some show that is slated for a New York opening in the near future. In the event that this fails to materialize, the committee has a big theatrical novelty on tap.

In the afternoon of Thursday a card party will be held for the ladies. It is intimated that the experts may bear away some delightful trophies. In the evening what is said to be one of the greatest convention entertainment stunts of business annals will be pulled. Headed by a famous "all-gas" band the delegates will march to the Hygeia salt water pool. A caravan of wheeled chairs will take the ladies. At the immense pool a great aquatic carnival will be held. Expert divers and swimmers will go through with their acts after which a grand tournament of the natatorial talent in gas ranks will be held. Candle races, canoe tilting, tug-of-war and a number of funny events are slated. Free bathing suits for everyone will be provided by committee. The joy will be fast and furious until 11 o'clock when the audience will adjourn to an Atlantic City cafe for light refreshments, dancing, cabaret and distribution of week's trophies. There will be no official entertainment on Friday and Saturday.

All events will be started after the dinner hour in the evening. The above program is a bare outline of the entertainment that is designed to balance a valuable program of new business papers. Conventions will be held in afternoons only, from 2 to 5 with exception of the opening session, Tuesday, which will be held at 10 o'clock in the morning.

Clinton, Mass., Alleys Lighted with Gas

The Clinton Gas Light Company is installing a new lighting system in alleys. According to Manager Freel, of the gas company, the new lights will make the local alleys the best lighted in the state.

Fayetteville, N. C., Company Makes Voluntary Reduction in Rates

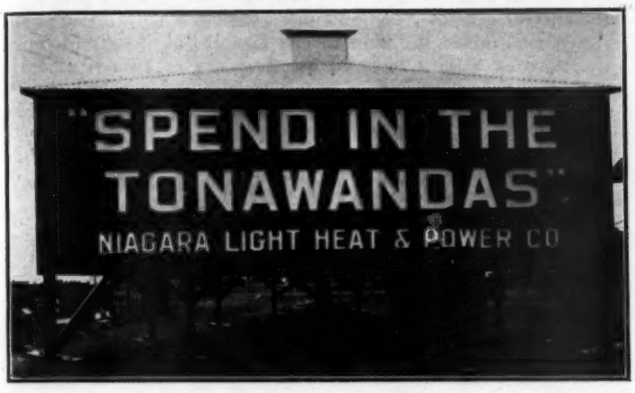
The Fayetteville Light & Power Company through it manager and secretary, A. R. Moffitt, has announced a reduction in rates to be effective Oct. 1. This is an entirely voluntary reduction, and is made possible, Mr. Moffitt states, by the expenditure of over $40,000 in the form of improvements at the gas works, extension of mains, gas service and the distribution system in general.

The new price of gas will be as follows: $1.75 illuminating rate to be stricken out entirely, and the rate for all gas to be $2.00 gross, less 50 cents per thousand for the first 5,000 cu. ft. consumed, less 55 cents per thousand for the next 5,000, less 60 cents per thousand for the next 5,000, less 65 cents per thousand for the next 5,000, 70 cents per thousand for the next 5,000, and on all over 32,000 cu. ft. there will be a discount of 75 cents per thousand; provided, of course, that the bills are paid during the usual discount period.

Tonawanda's Slogan Gives Incentive

"Spend in the Tonawandas," the gas slogan sign erected on the office building of the Niagara Light, Heat & Power Company, Tonawanda, New York, and illuminated for the first time about two weeks ago, is responsible for an agitation to erect a similar one to designate the City.

The sign was warmly received by the citizens of Tonawanda, and according to reports is giving the necessary stimulus to the citizens to abide by the sign's message. C. W. Wallace, general manager, believes that the chances are that the second sign will be erected to cost about $800, and that his company will secure the contract to maintain the illumination. The sign at present is flood-lighted by gas arc lamps and the nightly effect is striking.



FROSTED LETTERS STAND OUT ON DARK BACKGROUND BY DAY

210 Gas Heating Contracts Secured By Louisville Company in a Week

In the gas department of the Louisville Gas & Electric Company 40 new customers were secured during the week ending Oct. 13, and contracts were secured for 210 gas heating appliance installations. The gas output was 11.4 per cent ahead of the corresponding period of 1915.

Terms of Franchise to Utility Supplying Gas to Canton, Mass.

The Brockton Gas Light Company was recently given a franchise to serve the town of Canton, Mass., with gas, with the following regulations as to construction, prices and service:

1. Initial work of laying mains shall be only after approval of plans by the Selectmen, and all extensions must likewise have the Board's approval.
2. Mains and pipes shall be laid without unnecessary interference with street traffic and with water and sewer pipes.
3. Street surfaces shall be relaid as before.
4. A special inspector may be appointed by the Selectmen to oversee the work, one-half the cost being paid by the company.
5. Damages to pipes or property of the company shall not place liability on the town, unless "wholly and directly" due to the town's negligence.
6. Preference shall be given to resident laborers, but foreign help may be employed if needed to expedite the work.
7. All laws relating to gas companies shall be complied with.
8. Construction shall begin by May 1, 1917, providing suitable pipe can be obtained, and, if possible, completed within 18 months.
9. Written acceptance by the company is required.
10. Prices shall not exceed the following:

Annual consumption	Gross price	Net price
Up to 9,000,000 cu. ft.	$1.55	$1.45
9,000,000 to 12,000,000	1.50	1.40
12,000,000 to 15,000,000	1.45	1.35
15,000,000 to 18,000,000	1.40	1.30
18,000,000 to 20,000,000	1.35	1.25

11. The expense of service connections up to 150 ft. from the street line shall be borne by the company.
12. The company agrees to indemnify the town for all losses and damages, due to negligence.

PHOTOGRAPH OF SIGN AS IT APPEARS BY NIGHT

Heat Unit Standard Adopted in Upper New York State

585 B. t. u.'s Fixed as Minimum Average Heating Power—Likely that Commission for First District will Soon Follow Lead of Up-State Body

The heat unit standard for testing gas has been established for the territory under its jurisdiction by the New York State Public Service Commission, Second District. The minimum monthly average heating power is set at 585 B.t.u.'s. While this ruling effects only the upper section of the state, this journal has learned on good authority that a similar ruling will shortly be laid down by the commission for the First District, making the heat unit standard insofar as New York is concerned.

Ruling of the Commission

The commission's order reads in part as follows:

On and after Jan. 1, 1917, all coal gas, carburetted water gas, and mixed coal and carburetted water gas, manufactured and sold by persons, corporations, and municipalities, in amounts exceeding 20,000,000 cu. ft. per annum, for light, heat, or power, shall, when measured at the place provided for making the test and corrected to a temperature of 60 deg. Fahr., and a pressure of 30 in. of mercury, have a monthly average total heating power of not less than 585 B. t. u. per cubic foot, and shall not for any three consecutive days in such month average more than 5 per cent below 585 B. t. u. per cubic foot. The test to determine the heating value of the gas shall be made according to approved methods, within a 2-mile radius of the manufacturing plant, at a location selected by the company or municipality and approved by the commission, such location, however, to be subject to change by the Commission; provided, however, that where manufactured gas is delivered to the mains at a pressure above 5 lb. per square inch, it shall be tested for heating value before compression.

That each one hundred cubic feet of said gas shall contain not more than ten grains of ammonia, nor more than thirty grains of sulphur compounds.

That the gas sold, or manufactured and sold, shall exhibit no trace of hydrogen sulphide when tested as follows: If a strip of white paper moistened with 5 per cent by weight solution of acetate of lead, and exposed to a current of gas flowing at a rate of about 5 cu. ft. per hour, does not after thirty seconds of such exposure become discolored, the gas shall be considered to contain no hydrogen sulphide.

That every person, corporation, and municipality selling gas to the public shall keep posted in its principal office, in a place readily accessible to its customers, a statement of the average daily heating power of the gas furnished during the preceding calendar month, in order that the consumers and the public may be advised of the quality of the gas being supplied; all such records shall be permanently retained by the respective compilers thereof and shall be at all times available for examination by the commission.

That in case any person, corporation, or municipality subject to this order is unable to provide and install before Jan. 1, 1917, proper apparatus, tested and certified to be correct by the commission, for measuring the heating power of the gas manufactured or sold by it, application may be made by such person, corporation, or municipality for an extension of the time within which this order shall take effect as to such person, corporation, or municipality. If upon such an application it appears that due diligence has been used, a reasonable extension may be granted; provided, however, that until the expiration of any such extension the standards at present in force shall obtain and be observed by

the person, corporation, or municipality in whose favor such extension shall have been granted.

That except as herein otherwise provided, the order of the Commission of Gas and Electricity entered June 15, 1907, and all other requirements relating to standards of heating power, illuminating power, and purity of gas manufactured and sold by persons, corporations, and municipalities for light, heat, or power purposes, are hereby superseded by this order, pursuant to the authority vested in this commission.

That any person, corporation, or municipality manufacturing and selling less than 20,000,000 cu. ft. of coal gas, carburetted water gas, and mixed coal and carburetted water gas, per annum for light, heat, or power, may, with the approval and consent of the commission, adopt the standards created by and become subject to the other provisions and requirements of the order, precisely as in the case of persons, corporations, or municipalities manufacturing and selling in excess of 20,000,000 cu. ft. per annum.

The order is intended to relate only to the creation and establishment of a heat unit standard in place of the existing illuminating power standard for gas, and is not intended to in anywise affect existing tariff schedules, rates, or lighting contracts now in force in the Second Public Service District of the State of New York.

Operating Practice of Gas Company in "Spindle City"

Methods of handling ranges, lamps and domestic appliances; the disposal of coke, and effective advertising in connection with this part of the business, and relations with non-English speaking customers and prospects, are some of the problems which have been worked out to advantage by the Lowell (Mass.) Gas Light Company.

An appliance store is maintained on the principal business street, while the office is located on a side street about three blocks away. The store is attractively arranged with a line of gas ranges extending along both walls. In the center of the room, on large tables, are standing lamps, and a handsome assortment of hanging lamps is arranged at the far end, part of the lamps being lighted, which gives the room a pleasant homelike effect.

Gas ranges carried at the present time are the Sentinel, New Process, Chambers, Acorn, Vulcan and Clark Jewell. The Clow "Gasteam" radiator, Ruud and Vulcan water heaters and the Glenwood coke heater are now being featured; also Reliable "Hot Spot" reflector heaters.

Ranges sell at from $18 to $150. The company makes part payment terms of about 15 per cent down, with the remainder on instalments all due in one year. One dollar discount is allowed if the amount of the sale is paid in one month.

In connection with the deferred payment sale plan the purchaser signs a contract in which he agrees to replace and repair at his expense any worn out or damaged parts and to keep the unit in good working order; not to remove to another place, nor transfer, underlet or part with possession of the article.

The sale of by-product coke is being advertised by means of folders printed in both English and French. Lowell contains a large French-Canadian population, among which are a large number of the company's best customers. Many firms in the city find it to advantage to have a French-speaking clerk and to inscribe on the window "Ici on parle Francaise."

A folder points out that coke will save one's fuel bill one quarter. Lowell coke, the circular points out, is over 87 per cent pure carbon, made from the best Westmoreland coal. The secret of economical combustion is in having a large volume of fire under a very little draft.

High priced coal is now generally recognized by householders as being a good argument for the use of coke, and gas companies may well prove the opportunity. Recently the Lowell company requested Louis A. Olney, professor of chemistry at the Lowell Textile school, to report on the heat value of the company's coke. His report is as follows, for coke taken at random from the heap

Moisture	.57 per cent
Vol. comb. matter	2.12 per cent
Fixed carbon	87.06 per cent
Ash	10.25 per cent
	100.00 per cent

Average heat value 12,670 heat units.

The air-dried coke in 100 lb. of average commercial coke equals 94.43 lb., which results in the calorific value of 11,964 B. t. u.

"According to a bulletin of the U. S. Geological Survey the average heat units of anthracite coal delivered in all government buildings at Washington, D. C., for four months was 12,298 heat units," Professor Olney says.

"Assuming coal to be worth $7.50 a ton, and that a chaldron of coke weighs 1,440 lb., and then basing calculations on the preceding analysis, it is found that a chaldron of air dried coke is worth $5.56. Assuming coke as being worth $5.00 a chaldron, then one ton of anthracite coal is worth $6.73.

"It is very conservative to say that $5.00 worth of coke as sold by your (the Lowell) company carries as much heat value at $7.50," the writer concludes. Now that coal is $8.00 per ton, the efficiency of coke is 7 per cent more than the above calculation.

A pocket folder on "How to Use Lowell Coke" contains minute directions as to how to build the fire, how to keep it at various times in the day, and how to keep it at a low point in mild weather. A diagram points out how to keep the heater in proper operation.

The "Story in a Nutshell" says:

1. Start fire as for coal
2. Use same size coke as you would coal
3. Keep fire-pot full
4. Use slow draft
5. Poke fire from top rather than shake
6. Bank fire with fine coke or ashes
7. Open drafts to start fire quickly
8. Keep check in door open a small amount
9. Notify the company of any trouble
10. We guarantee satisfaction and service.

At certain times of year the company has issued coupons good for fifty cents toward one chaldron of "Lo Gas Co." coke, as the company calls it.

Words of Wisdom from the Daily Press

The utilities man has learned from experience not to expect to find an unusual amount of intelligence—or better said, common fairness—shown in the comments of the daily press on matters relating to controversies between municipal or other governing bodies and privately-owned public utilities. The following, clipped from the *Chicago Herald* should therefore prove of interest:

"The gas company has offered to settle its long-standing differences with the city through friendly negotiation. Why cannot the conflict be settled permanently? The city desires a just rate; the company presumably wants a fair return on its property. Is it not possible to satisfy both by devising a scheme through which the rates might be progressively lowered while the investment was made more attractive to its owners?

"Other cities have pioneered along this line. Agreements have been worked out by which every decrease in the rate charged is rewarded with the privilege of increasing dividends. The arrangement supplies a motive for economical invention and for the elimination of waste. If the management knows that economies in production may be reflected in dividends, cheaper manufacturing is naturally stimulated.

"The present negotiations between the gas company and the city council ought to result in some such plan. Lower gas rates can be reached through conferences much more quickly than would be possible under the older method of wrangling and endless litigation. The gas case of 1911 is still remote from a judicial ending. Common sense approves the settlement of all outstanding questions through honest compromise.

"The gas company, even though a monopoly, needs the friendship of its customers just as badly as does the corner grocer. The consumers equally want a just and pleasant co-operation from the company. This can be secured permanently through an arrangement for the continuous mediation of all differences. An agreement which automatically decreased the gas rate when the dividends were increased, which permitted larger dividends only when lower rates were established, would seem to do justice all around. And it would take gas out of politics."

Welsbach Company Moves into New Buildings

Group Constructed Not Only With View to Efficiency of Operations, But to Comfort and Health of Workers as Well—Mantle-hardening Room Not the Place of Discomfort as is Common With Such Rooms

The new group of buildings of the Welsbach Company at Gloucester, N. J., are now almost completed, and a good part of the working force and equipment have already been moved into them. The buildings are of reinforced concrete with unusual window area, and are exceptionally well ventilated and comfortable throughout. The total cost of the work, completed up to the present, amounts to more than $1,000,000 and considerably more will have to be spent in putting on the final touches to the buildings and grounds.

$48,000 Reclaimed Annually From Air in Mantle-Dipping Room

The feature of the knitting room is the equipment by which the air is kept free from flying lint, which would obviously be a source of danger to the employees' health. The problem of freeing the atmosphere from this menace has been solved by the

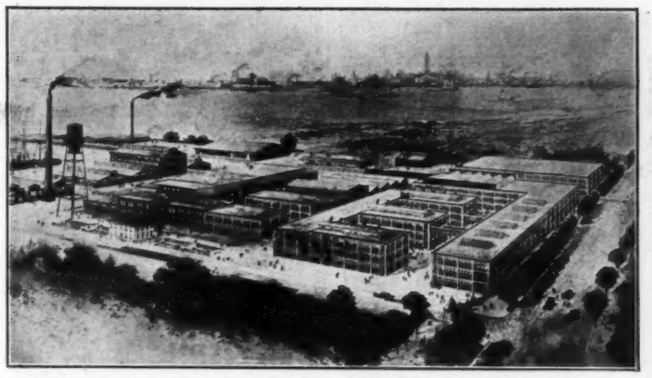
ALL WORKING ROOMS EXCEPTIONALLY LIGHTED

company by attaching to each knitting machine a vacuum suction with a fine slit. It is necessary for all lint to pass this suction as it comes off the spool, and as it does so it is caught and carried away.

The mantle-hardening rooms are distinct from what it is generally expected such rooms will be, in that there is an almost entire absence of discomfort due to the intense heat from the furnaces. In fact, one must be quite close up to the burners to feel any particular heat at all.

On a hot summer day the temperature in the mantle-hardening room is cooler than that in the outside air.

SEPARATE BUILDING MAINTAINED FOR COMFORT AND WELFARE OF WOMEN EMPLOYEES



NEW GROUP CONSTRUCTED OF REINFORCED-CONCRETE

This is accomplished by refrigerating the air which is constantly supplied to the room at points where it will do the most good, and the heat is conducted away through the roofs and sides as rapidly as it is generated. The air is also sterilized.

The comfort of the worker is provided for against the heat that she would otherwise be subjected to, due to her necessary proximity to the machine, by a curtain of outside air which she is able to place between herself and the jets by pushing with her foot a lever which operates an air blast.

The air in the room where the mantles are dipped with the coating that protects them in shipping is reclaimed mechanically, and chemicals to the value of $48,000 are obtained from it annually.

The safety and welfare work of the company is very effective. Included in the new group is an enormous roof-garden which is styled very much after the high-class hotel roof-garden, and is for the use of employees, regardless of station. From it a view of the surrounding country for many miles can be seen on an ordinarily clear day.

The women employees have a separate building set aside for their exclusive use, wherein there are rest rooms, music room, reading room, writing room, dressing rooms, and a hospital with a ward and operating room with dispensary. Medical aid is free to all employees whether taken sick at work or at home.

In the Tubing Department there are four machines, each of which make 42,240 ft. of tubing a day. The tubes are all labelled by machinery.

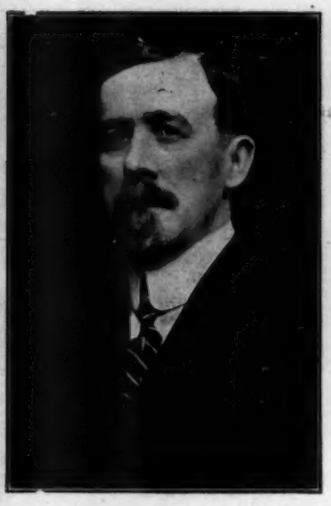
The freight elevators in the new buildings work automatically. Cases placed on them on one floor are dumped off by the equipment at any other floor desired.

Process of Manufacture

The process of manufacture begins in the knitting room, where spindles of thread, which later become a long woven tube, are

A CORNER OF THE KNITTING ROOM

F. N. HAMERSTROM,
Commercial Manager



H. S. MINER,
Chief Chemist

E. L. KNOEDLER,
General Superintendent

SIDNEY MASON,
President

the basic factors of the production. The fibre is made by pressing a pulp through very thin holes in a steel plate with great pressure. After the knitting comes the washing of the fabric tubes. This is done so effectively that the mineral impurity does not show more than 15 parts to every 100,000, as against from 50 to 60 parts, which is shown in the absorbent cotton used in surgical operations.

HOWARD LYON, DISCOVERER OF THE WELSBACH KINETIC PRINCIPLE GAS LAMP

After the webbing is washed and dried, it is saturated with a solution of thoria. It is then immersed in a receptacle lined with lead, and is put through an equalizing machine which regulates the amount of thoria to be used. It is then placed on large revolving drums fitted with spokes and is dried by centrifugal force.

After this the webbing is cut in the proper lengths and these are passed to women workers who fold and plait one end, and sew the asbestos cord through the plaits. They are next shaped over wooden forms, after which they are suspended over specially constructed gas burners, and the fabric burned away.

The hardening process follows. A long row of mantles is carefully adjusted over a blow pipe, and the flow of gas and air is controlled by levers. The intense heat hardens them, after which they are immersed in collodion and dried in specially prepared cases. After trimming and inspection the mantles are ready for shipment.

In the course of a day 250,000 mantles are manufactured and packed at the Welsbach plant.

Gas Rates Offered to Cities on North Shore of Lake Michigan

The North Shore Gas Company has made its best offer to Waukegan and other municipalities along the north shore.

Following is the net rate of prices as offered by the company:

Minimum bill, per month	$ .75
First 2,000 ft. per thousand	1.00
Next 10,000 ft. per thousand	.90
Next 88,000 ft. per thousand	.80
Next 100,000 ft. per thousand	.70
All over 200,000 ft. per thousand	.60

All gas served through prepayment meters at flat rate of $1 per 1,000 ft.

$4,000 Is Sought for Gas Appraising

To carry out recent instructions of the City Council of Los Angeles, Cal., to investigate natural gas rates and the sliding scale of rates now allowed by the Economic Gas Company, the Board of Public Utilities yesterday decided to urge the Council to appropriate $4,000 to pay for appraising the Economic Gas Company's property.

City Attorney Stephens is preparing to file the necessary application with the Railroad Commission for a hearing of the Economic Gas Company's rates, just as soon as the Board of Public Utilities is able to make its valuation of the company's properties.

A MANTLE HARDENING ROOM

The celebrated Dr Carder prescribing a beach stimulant

Re-introducing Dr. Carder of Rio

Among those in attendance at the annual convention of the American Gas Institute held in Chicago, recently, was Lewis James Carder, of Rio de Janeiro, Brazil. Mr. Carder came on one of his quinquennial pilgrimages. Although born and reared in New England, a greater part of his accomplishments have been attained in the south. In his early days he was with the Brooklyn Borough Gas Company, after which he went to Jacksonville, Fla. From Jacksonville he went to Rio, where he interested himself in gas and raising the standards of mint-julep manufacture in that country. Upon his departure, on the present journey, friends and well-wishers gave a farewell dinner for him, and published a six page booklet giving intimate details in regard to his career in that country, which this Journal considers too personal for reproduction. The accompanying illustration is reproduced from cut in the booket.

September Coal Shipments Show Decrease

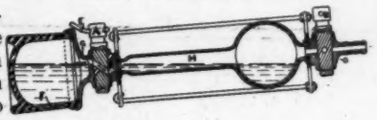
The following is a statement of carloads of bituminous coal and beehive coke that originated on 49 railroads in September, compiled from reports received by the U. S. Geological Survey by noon, Oct. 16:

	Sept., 1916	Aug., 1916	Sept., 1915
Carloads of bituminous coal	441,256	455,453	437,267
Carloads of beehive coke (9 roads)	54,664	51,834	46,976

September, 1916, showed an increase in shipments of bituminous coal of 0.9 per cent over September, 1915, and a decrease of 3 per cent from August, 1916. The increases in shipments of beehive coke for the same month were 16 per cent and 5 per cent, respectively.

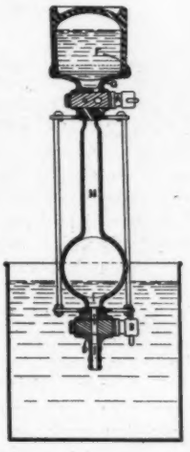
Test for Carbon Dioxide in Fuel Gas Can Be Taken in 2½ Minutes with Pocket Indicator

The percentage of carbon dioxide in the flue gases from boilers, furnaces, etc., can be determined, it is claimed, in 2½ minutes by means of the new Pocket C O_2 Indicator, which has recently been put on the market by the Bacharach Industrial Instrument Company of Pittsburgh. The same man can go from one furnace to another, and take tests at the rate of 20 an hour. The U. S. Bureau of Mines asserts that at this rate, and with ordinary care, the analysis made with the instrument shows a maximum error of ± 0.2 per cent.

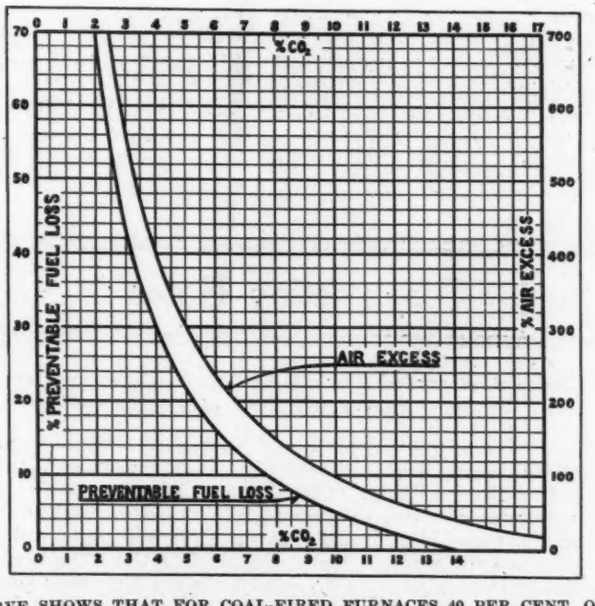


After taking the Indicator out of the case, the rubber stopper shown in an accompanying illustration is removed and the two cocks "A" and "B" are put into their places. The cocks are easily distinguished from each other, cock "A" having a bent handle. The glass jar "F" at the lower end is then removed from the metal body "C" and filled with the analyzing solution, after which it is screwed on again. With the pump attached to the open upper valve "D," and the cock of the lower valve "A" turned, so that the glass measuring tube "H" in center is open to atmosphere through hole "C," the Indicator is ready for use.

The glass jar "F" having once been filled with KOH (one filling is enough for 200 determinations), the open end of the pump is connected to the gas line from which a sample is to be taken. The gas is now pumped in, at the same time allowing the air to escape to the atmosphere through hole "C." When a fair sample of gas has been collected (about 30 strokes of the pump being sufficient), the upper cock "B" is closed.



The lower cock "A" is then turned 180 deg. to permit the gas and KOH to come in contact for chemical action, helping the process by holding it inclined downwards and shaking it. When the solution has been drained back to the glass jar "F," the lower cock "A" is closed and the indicator held vertically upside down and immersed in water. The submerged cock "B" is opened and the ingoing water, which takes the place of the absorbed CO_2, is leveled with that outside. The cock "B" is then closed and the indicator brought to its base. Opening the cock "B," the per cent of CO_2 is read off on the tube at the water level. Turning the apparatus upside down, the water will run out through the open cock "B," and the instrument is ready for another determination.



CURVE SHOWS THAT FOR COAL-FIRED FURNACES 40 PER CENT. OF EXCESS AIR IS NECESSARY FOR MOST EFFICIENT COMBUSTION

Pittsburgh Water Heater Company Appoints Agents

It has recently been announced that the Ross Sales Agency Company will take charge as agents for the Pittsburgh Water Heater Company of the territory of Columbus and Central Ohio. They will carry a complete assortment of "Pittsburg," "Bungalow" and "Lion" gas water heaters and repair parts.

Societies and Associations

The Pittsburgh Section of the Illuminating Engineering Society held a regular monthly meeting at the Engineers Society Auditorium, Oliver Building, in that city, Oct. 27. The speakers of the evening were J. L. Minick, of the Pennsylvania Railroad Company; Alan Bright, of the Macbeth Evans Glass Company, and O. H. Eschholz, of the Westinghouse Electric & Manufacturing Company.

Personal Notes

JOHN G. PEW, for 30 years connected with the Peoples Gas Company of Pittsburgh, Pa., has been elected president of the company. Mr. Pew has served as vice-president and general manager of the Peoples Company and vice-president and manager of the Hope Natural Gas Company. Mr. Pew is also vice-president and secretary of the Oakland Savings & Trust Company; president of the Marion Oil Company and a director of the Pittsburg Trust Company and the Terminal Trust Company. His connection with the Peoples Company began in 1886. When it was purchased by the Standard Oil Company, Mr. Pew was made city superintendent and assistant to E. Strong, then vice-president and general Manager.

GEORGE A. PRICE of the Urbana and Champaign Gas & Electric Company, has been appointed supervisor of gas crews for the Illinois Traction System, covering the several different properties in Illinois, Missouri and Iowa.

LOUIS S. WILSON, gas inspector in the engineering department of the Maryland Public Service Commission, has tendered his resignation, to take effect Nov. 1. Mr. Wilson has been making the gas tests for the Commission from the date of the organization of that body. Prior to that he was the gas inspector for Baltimore. The law creating the commission transferred all the gas inspection work that had been done by the city lighting department to the commission.

C. P. LUKENS, of Jenkintown, Pa., has been transferred to the Bangor Gas Company branch of the American Gas Company, and is now engaged in the office sales department of the company in this city.

JOHN J. HUNTER, formerly superintendent of the Rome Municipal Gas Company, of Rome, Ga., has been appointed superintendent of the Fayetteville Light & Power Company, of Fayetteville, N. C.

Construction Notes

Contract Awarded For 11-Ft. Double Superheater Carburetter Apparatus at Denver

The Gas Machinery Company of Cleveland, Ohio, has been awarded a contract by the Detroit City Gas Company of Detroit, Mich., for the installation of an 11-ft. double superheater carburetter water gas apparatus, complete with waste heat boiler to utilize the waste heat in blast gases. This apparatus will be installed in the Station A of the Detroit City Gas Company, in the new building adjoining the present water gas generating house.

Escanaba, Mich., Gas Holder to be Ready By Nov. 1

The big tank that Stacey Bros. Construction Company is erecting in this city is nearing completion. This new gas holder will greatly increase the supply of gas and is expected to be completed within a few days.

Newman, Cal., to Have New Gas Plant

At the third application for the organization of the stock company to take over the abandoned gas plant at Newman, Cal., C. S. S. Forney has convinced the railroad commission that the scheme is not a mere stock selling venture. Although not final, it is understood that the permit will be forthcoming as soon as the total of $22,000 is in the treasury of the company. This is the estimated cost of the new plant and includes the purchasing of the old system.

LOS ANGELES, CAL.—Improvements to cost $356,789 are planned by the Southern Counties Gas Company it has been announced. The contemplated work embraces the completion of the Pomona-Brea line and an additional transmission main between Whittier and Monrovia.

HARTFORD, CONN.—Residents of Forestville have petitioned the Public Utilities Commission to order an extension of mains of the Bristol & Plainville Tramway Company to the junction of Brook Street and Stafford Avenue, about 3,000 ft.

STAMFORD, CONN.—The Stamford Gas & Electric Company will probably be able to occupy its new buildings in lower South Street, the first of the year. The steel is all in place and now some of the heaviest machinery is being installed.

WATERTOWN, CONN.—A new main is being laid on Scott Avenue about 1,000 ft., to provide service to a number of families.

WINSTED, CONN.—The Winsted Gas Company is contemplating the erection of a new plant to be built on its recently purchased property.

CANTON, MASS.—Citizens have voted to procure the installation of a gas system in the Ponkapoog section of this city.

DANVERS, MASS.—The Board of Selectmen have authorized the Beverly Gas & Electric Company to relay its main through Danvers Square. The work will be completed this fall.

MELROSE, MASS.—Permission has been granted to lay 250 ft. of main in Sixth Street.

SPENCER, MASS.—The concrete foundations for the new holder of the Spencer Gas Company are in place and the erection of the holder will soon be started.

BEMIDJI, MINN.—D. A. Fredrichs, head of the Public Improvement Company, is supervising the laying of 12,000 ft. of piping for the new gas plant in Bemidji. Efforts are being made to begin the service about Christmas time.

SOUTH RIVER, N. J.—City plans installing gas unit. Cost about $50,000.

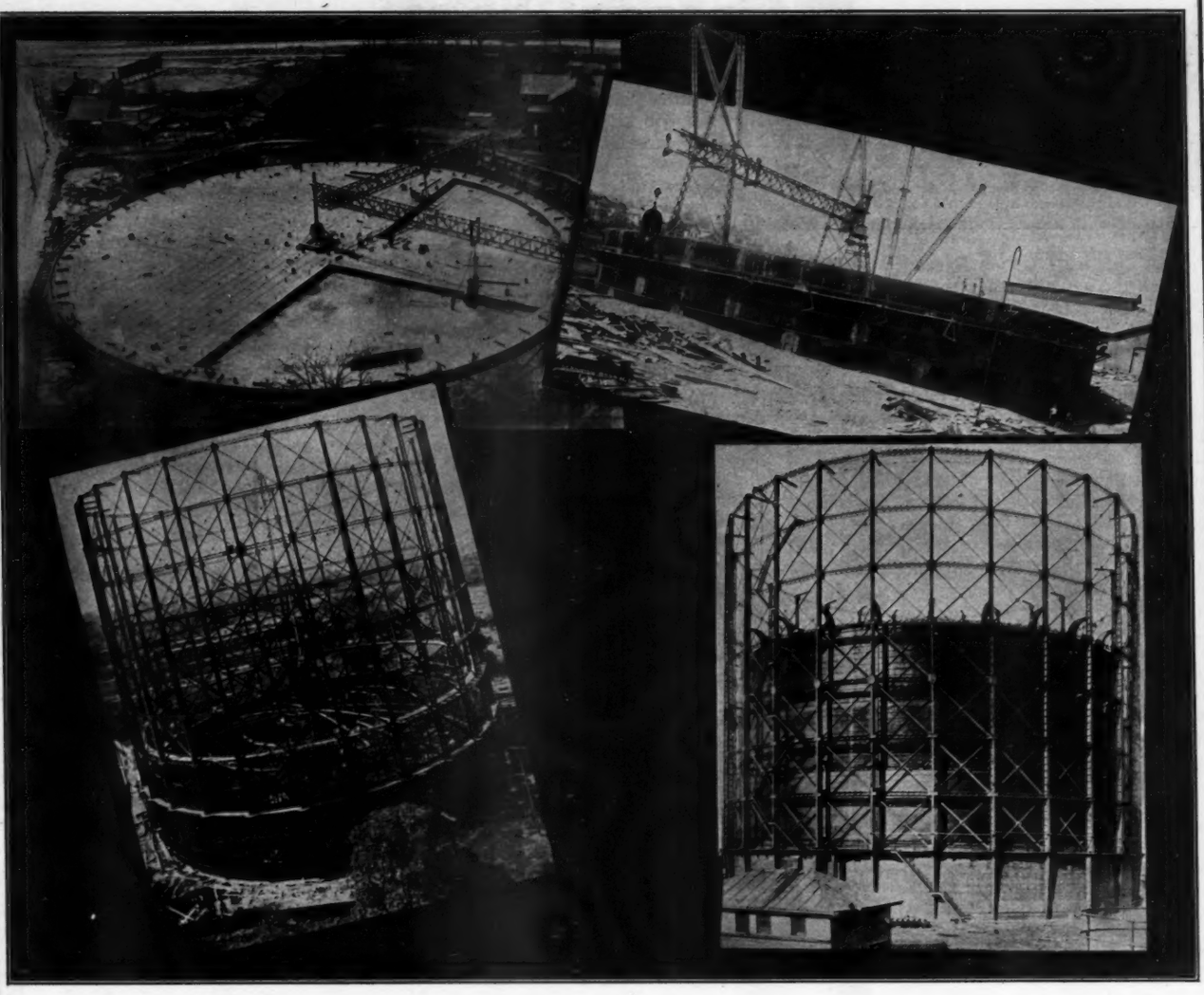
MCALESTER, OKLA.—The McAlester Gas & Coke Company of McAlester is laying new mains, making lateral connections and building a new reducing station to take care of the 40,000,000 cu. ft. of natural gas which is accumulated daily from the company's wells, located near Quinton and Blocker, Okla.

PETROLIA, ONT.—Union Natural Gas Company plans a 2-mi. high pressure gas line. F. James Chatham, Mgr.

FOREST GROVE, ORE.—Application for a franchise by the Portland Gas & Coke Company to lay mains here has been made. It is understood that the company proposes to ask a franchise for laying mains in the county also.

BREMERTON, WASH.—The mayor has vetoed the proposed franchise for the gas plant here, which was granted to E. L. Blaine, of the Graff Construction Co., Seattle. This would have called for the expenditure of $150,000.

FOND DU LAC, WIS.—The increase in the number of consumers has made necessary the installing of larger mains. The excavating of trenches has been begun and better service is to be expected.



RITER-CONLEY COMPANY

STEEL CONSTRUCTION

PITTSBURGH

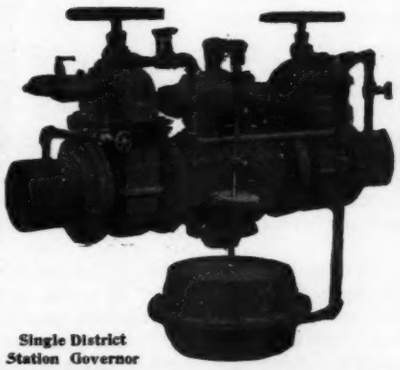
REYNOLDS GOVERNORS

We make anything desired in the GAS GOVERNOR or REGULATOR to meet any and all classes of reductions. Stations for DISTRICT SERVICE, INDIVIDUAL HIGH PRESSURE GOVERNORS for reducing high pressure gas to inches of water. Holder and Low Pressure Service Governors. A steady, uniform pressure can be obtained by using REYNOLDS GOVERNORS, "THE WORLD'S STANDARD." We make a specialty of the Governor business, devoting our entire time to the manufacture of same. All Governors are GUARANTEED.

Combination Governor
Governor and Mercury Seal

REYNOLD'S GAS REGULATOR COMPANY
ANDERSON, INDIANA. U. S. A.

Write for instructive Catalog



Single District
Station Governor

Financial Notes.

THE ALABAMA POWER COMPANY reports gross earnings for September aggregating $130,940, increase $40,945; net $88,150, increase $31,023. Twelve months' gross $1,376,731, increase $414,993; net $861,480, increase $289,312.

THE AMERICAN GAS COMPANY will redeem its $1,000,000 three-year 6 per cent secured gold notes on Nov. 1 at 100½ and interest.

THE COLUMBIA GAS & ELECTRIC COMPANY officials figure, that through the gas ordinance bill signed by the Mayor of Cincinnati increasing the price of gas from 30 to 35 cents a thousand feet, an annual increase of between $400,000 and $500,000 in net earnings will result.

THE CONSOLIDATED GAS COMPANY OF BALTIMORE through their recent affiliation with New York bankers, have good prospects of increasing the dividend from 7 to 8 per cent annually. An initial dividend of 4 per cent annually was paid in April, 1910. The rate was increased to 5 per cent in April, 1911, to 6 per cent in April, 1913, and to 7 per cent in October, 1914. The company has also given formal notice that it will exercise the right of redemption of all its outstanding preferred stock on April 2, 1917, at 120. After November 17, 1916, and before April 1, 1917, it will also purchase all preferred stock tendered at 120 and accrued dividends to date of purchase.

THE FEDERAL LIGHT & TRACTION COMPANY reports for August gross earnings amounting to $203,228, increase $23,680; net income less interest charges $25,671, increase $15,669, or 156 per cent. Gross for twelve months ended August 31 was $2,475,975, increase $102,256; balance after charges and dividends $129,408, decrease $38,570.

THE MASSACHUSETTS LIGHTING COMPANIES' September net sales were $121,574, an increase of $14,857, or 13.9 per cent over the corresponding month a year ago. Total net sales for nine months ending with September were $941,000, an increase of $111,666, or 13.4 per cent.

THE MASSACHUSETTS GAS COMPANIES report, for the twelve months ending June 30 a surplus after preferred dividends, of $1,660,167, equivalent to 6.64 per cent on the outstanding common stock, as against 5.91 per cent in 1915, 5.56 per cent in 1913 and 6.07 per cent in 1912. The surplus before dividends for 1916 amounted to $2,660,167, as against $2,478,121, in 1915, $2,391,149 in 1914, and $2,517,951 in 1913.

THE MILWAUKEE GAS LIGHT COMPANY, one of the principal subsidiaries of the American Light & Traction Company, is now showing large gains in earning power. For the year ended June 30, 1916, surplus, after depreciation reserve, was at the rate of more than 20 per cent on the $5,000,000 stock. All this stock is owned by the Western Gas Company, the stock of which in turn is owned by the American Light & Traction Company. For the year ended June 30 gross was $2,593,790, with net of $1,587,684 and surplus, after fixed charges and depreciation reserves, of $1,080,561.

THE PUBLIC SERVICE CORPORATION OF NEW JERSEY reports a total business increase in September amounting to $423,477, or 13.2 per cent over September, 1915, while balance for month available for dividends, amortization and surplus was $562,707, a gain of $98,439. For nine months ended September 30 total business gain was $3,630,254, or 13.2 per cent over corresponding period of 1915, while balance available for amortization, dividends and surplus was $3,927,314, increase of $888,504.

THE ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER COMPANY has been granted authority to create new mortgage securing its first and refunding 5 per cent 30 year bonds and has authorized immediate issue of $751,000 of new bonds, $236,000 of this amount being for refunding of bonds now outstanding on interurban railway lines.

THE SAN JOAQUIN LIGHT & POWER COMPANY reports for twelve months ended August 31 gross earnings aggregating $1,843,980, increase $72,146; net $1,136,466, increase $78,170; balance after interest $656,629, increase $78,374.

THE UNITED GAS IMPROVEMENT COMPANY subsidiaries continue to show large gains, and for the nine months ended Sept. 30 sales of gas of companies outside Philadelphia increased 6.4 per cent, and in the latter city 5.98 per cent over the corresponding months of 1915. It has been seven years since United Gas Improvement made an increase in its stock capitalization, and it is reported that some time in the next year a distribution of stock may be looked for. The company has a capital stock of $55,500,000, and a surplus of $32,500,000, and it is believed that a part of this surplus may be distributed in the form of additional stock.

THE UNITED LIGHT & RAILWAYS COMPANY reports that gross earnings of operated properties for twelve months ended Sept. 30 are $6,760,507, increase of $582,294, with net after taxes of $2,676,908, gain of $280,078. Surplus after charges amount to $1,276,214, increase $241,099.

Current Prices of Public Utility Securities

	Bid	Asked
Adirondack Elec. P	25	27
Adirondack Elec. P. pf	83	85
American Gas	120	123
*American Gas & Electric	152	156
*American Gas & Electric pf	49	51
American Light & Traction	382	385
American Light & Traction pf	111	113
American Power & Light	73½	76
American Power & Light pf	83	85
American Public Utilities	42	46
American Public Utilities pf	74	77
American Water W. & Elec	8¼	9
Amer. W. W. & E. 1st pf	62	65
Amer. W. W. & E. part'p pf	22	25
Carolina Pow. & Lt	27	30
Carolina Pow. & Lt. pf	97	100
Cities Service	323	326
Cities Service pf	92¼	94
Colorado Power	28	30
Colorado Power pf	100	101½
Commonwealth, Pr. Ry. & Lt	61½	63½
Commonwealth, Pr. Ry. & Lt. pf	84	86
Electric Bond & Share pf	99½	100
Empire District El. pf	88½	92½
Federal Light & Traction	21½	23
Federal Light & Traction pf	54	58
Gas & Electric Securities	290	310
Gas & Electric Securities pf	95	100
Northern States Power	103	105
Northern States Power pf	100	102
North. Ont. Lt. & P	14	17
North. Ont. Lt. & P. pf	56	61
Ozark Power & Water	44	48
Pacific Gas & Electric	57½	58
Pacific Gas & Electric pf	90½	91½
Republic Ry. & Light Co	51¾	52¾
Republic Ry. & Light Co. pf	79	81
*Standard Gas & Electric	14½	15¼
*Standard Gas & Electric pf	41½	43
So. Cal. Edison	92	93
So. Cal. Edison pf	106	108
Tennessee Ry., Light & Power	13	13½
Tennessee Ry., Light & Power pf	54	54½
United Light & Railways	51	53
United Light & Railways 1st pf	81	83
Western Power	19	19½
Western Power pf	69	70

*Par value $50